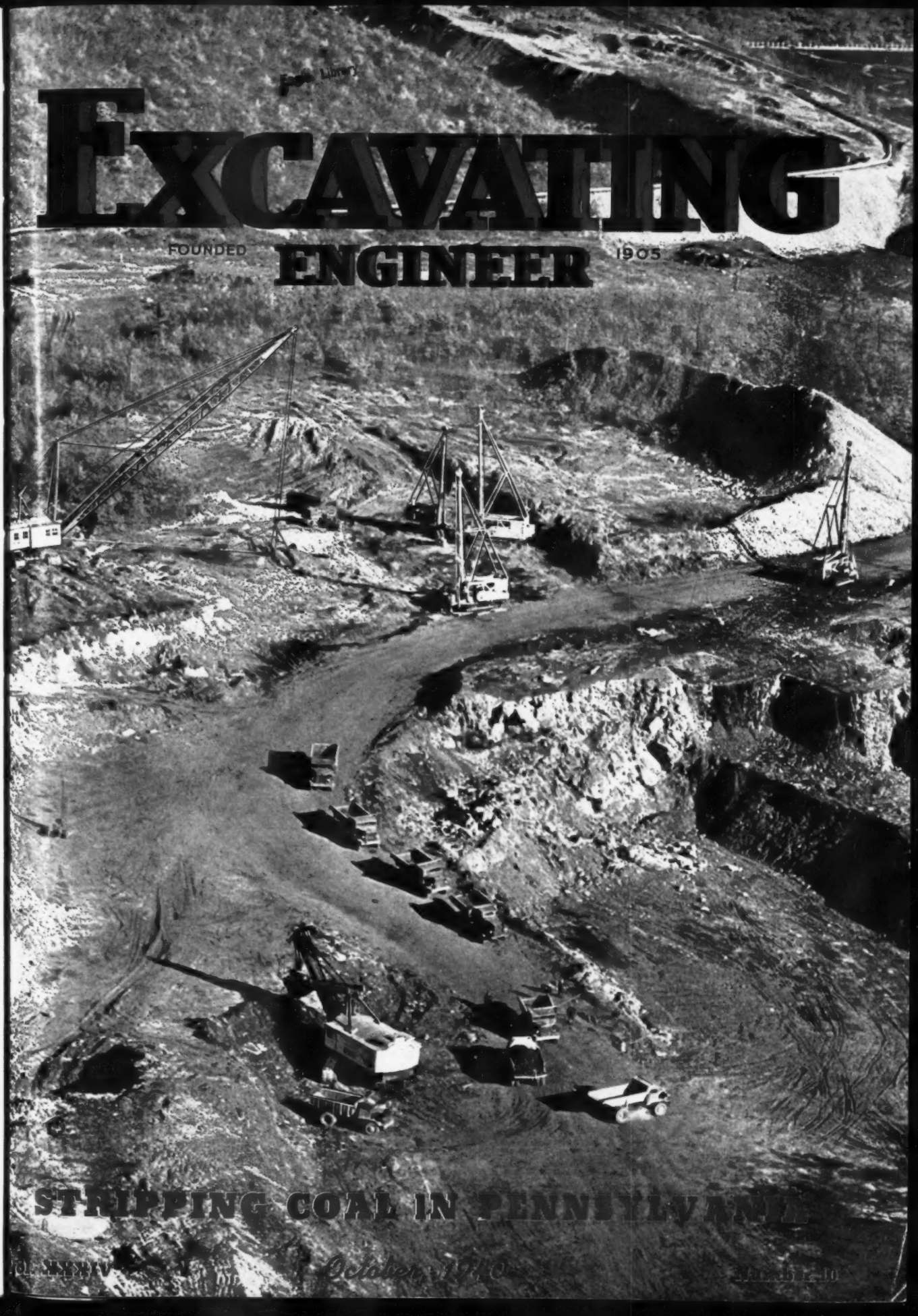
EXCAVATING
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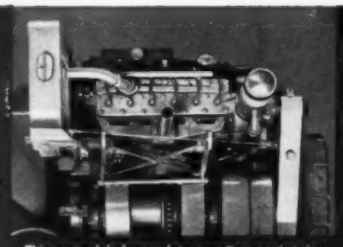
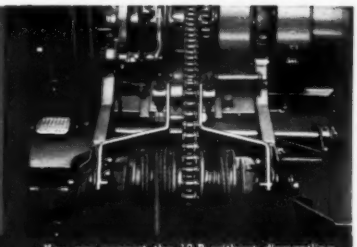
STRIPPING COAL IN PENNSYLVANIA

CHECK these features

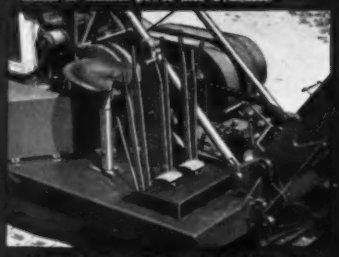
against any other 3/8 YARD EXCAVATOR



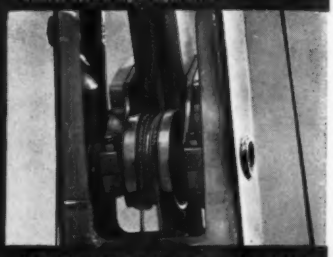
This powerful, heavy-duty gasoline engine is tailored for excavating service with special carburetion, manifolding and governor control. Diesel or electric power also available.



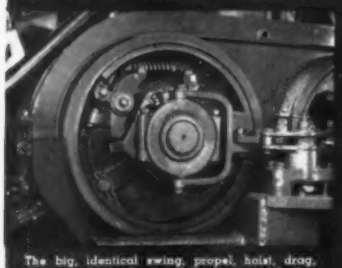
You can convert the 10-B without dismantling or adjusting the crowd-drive on boom and handle. You can also change the boom angle without crowd rope adjustment.



All controls are at the operator's position; they are easy to work and there is no awkward reaching. The big seat is fully adjustable. All machinery is conveniently accessible.

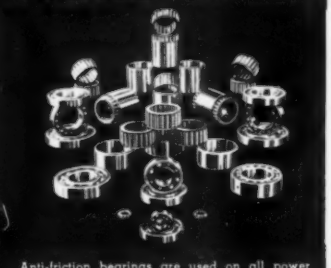


Powerful, positive twin rope crowd and high speed retract eliminate complicated, heavy and expensive wearing parts. Fully independent of all other functions.



The big, identical swing, propel, hoist, drag, and crowd clutches and brakes provide immediate and uniform response to operator's touch on the control.

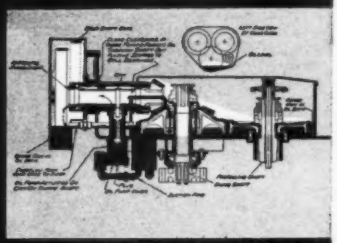
Here's a dipper that's in a class by itself. Welded-and-cast construction gives strength without excess weight. Curved door opens wide for quick, complete dumping.



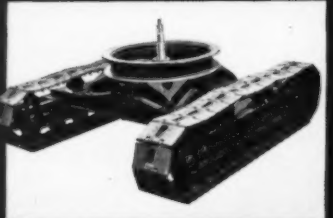
Anti-friction bearings are used on all power transmitting parts on revolving frame used in the digging cycle. Clutch adjustments are rarely necessary and easily made.

Conical hook swing rollers, lifetime adjustment. No center pintle. 3-point suspension on outer diameter of swing circle equalizes loads on a long lever arm.

The big live boom point sheaves increase rope life and add to effective boom length. Smoothness of 10-B operation due to perfect synchronization and control.



All gears for power transmitting functions — hoist, crowd, drag, swing, propel, and boom hoist—plus the multiple roller-chain from engine are fully enclosed in oil.



Friction clutch steering gives tractor flexibility. The 10-B climbs steep grades, maneuvers in close quarters, moves fast (to 4¾ miles per hour), anywhere on the job.

For job to job moves, the convenience and speed of Bucyrus-Erie transport wheels means less time moving . . . more time digging . . . bigger earnings.

Bucyrus-Erie Co.

SOUTH MILWAUKEE, WISCONSIN

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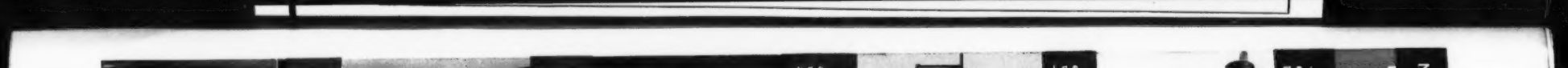

EXCAVATING ENGINEER

FOUNDED 1905

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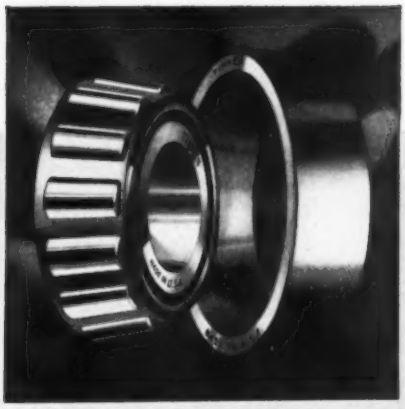

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OF DEVELOPMENT AND EXPERIENCE

The successful application of roller bearings to any type of equipment requires two basic factors.

FIRST, CORRECT BEARING DESIGN, MATERIAL AND CONSTRUCTION

The TIMKEN Bearing of today is the finest tapered roller bearing that has ever been made. Timken history over a period of 42 years is a story of continual improvement in bearing design—in fact Timken has pioneered every important refinement and improvement ever made in tapered roller bearings. Among these Timken achievements are: the one-piece multiple perforated cage; TIMKEN Electric Furnace Alloy Steel; TIMKEN Bearing surface finish, the finest finish known to modern bearing science; and wide area contact between the ends of the rollers and the under-cut rib of the cone, thus assuring accurate roller alignment around the periphery of the raceways, without which high bearing speeds would be impossible.

SECOND, LONG EXPERIENCE IN APPLYING THE BEARING TO MEET THE PROBLEMS OF ANY TYPE OF EQUIPMENT

Timken has successfully applied bearings to every kind of mechanical equipment. It takes several years to thoroughly prove the successful use of bearings in meeting the individual specialized problems of any given condition of service. Timken's vast fund of experience takes the guesswork out of bearing application.

When you install TIMKEN Bearings you are not experimenting. You get both of these two important basic factors that are so necessary for dead-sure, satisfactory bearing performance: *first*, correct design, material and construction; and *second*, 42 years of engineering experience in applying bearings.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

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For your convenience in writing to The Timken Roller Bearing Co., you will find a card bound in this issue.

Low Cost OUTPUT *for* SALE

When you put a Bucyrus-Erie 120-B on your job, you know you're going to get performance that means output at bottom costs. These modern excavators have been proved for you by acceptance of leading mines and quarries all over the world. Outfits that know to a penny what it costs them to move rock and ore have tested Bucyrus-Eries thoroughly — and have bought more of them than of all other quarry and mining shovels combined.

When your job demands a shovel or dragline to move big yardages fast and at low cost, investigate Bucyrus-Erie's complete range of modern excavating equipment. Here's a line that has been proved in the toughest digging there is!

BUCYRUS ERIE

Bucyrus-Erie

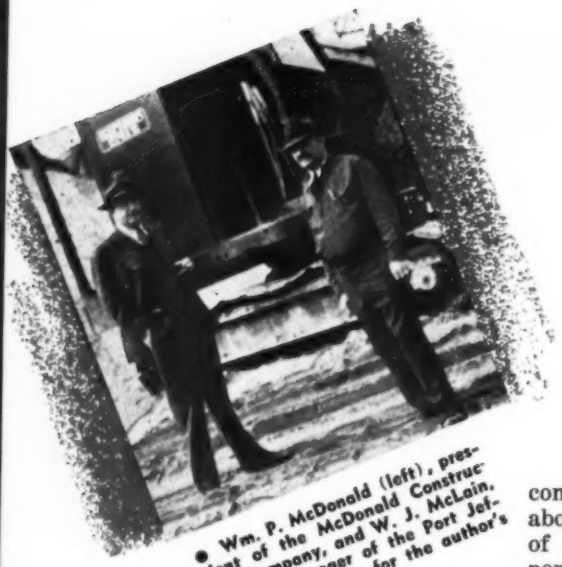
SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

SAND FOR

A complete description of the modern machine methods that enable the Wm. P. McDonald Construction Company to make a profit in the mass production of aggregate at their North Shore Sand and Gravel Plant

By SPENCER JONES



● Wm. P. McDonald (left), president of the McDonald Construction Company, and W. J. McLain, general manager of the Port Jefferson plant pose for the author's camera.

A GOOD MANY thousand years ago a series of advancing and retreating glaciers ground up and deposited billions of yards of high-silica rock in the form of sand near what is now known as Cow Bay, at Port Washington, Long Island, New York. What were once the tops of high hills in Connecticut, Massachusetts, and New York, possibly hundreds of miles to the north, are now huge hills of sand on the northern shore of Long Island.

The deposit at Cow Bay is probably the most famous near New York City for two reasons. Cow Bay sand, being a glacial moraine, is sharp and clean, quite different from water-deposited bank sand which is too frequently rounded and dirty with silt. Cow Bay sand is also one of the few deposits of its kind from which shipments can be made to New York City by a comparatively short water haul of about 25 miles. This combination of high quality and easy transportation has, for many years, made Cow Bay sand the standard in this area by which other sands are judged as to quality and delivered price.

The sand deposits near Port Washington are so extensive that many pits have been operated during the past hundred years, starting near the waterfront and gradually working back inland. The increasing distance between the pits and scows created internal transportation difficulties and added materially to the operating expenses, particularly when operators clung to outmoded equipment for excavation, internal transportation and loading. This resulted in the abandonment of several pits as being unprofitable to work under such conditions.

Abandoned Pit Purchased

One of these abandoned pits was taken over in 1939 by Wm. P. McDonald Construction Company, Flushing, Long Island, and given the name of North Shore Sand and Gravel Plant. This pit comprises an area of 71.3 acres on which the sand deposit is about 55 to 75 feet deep, with many millions of yards of sand available. The center of the tract is about 1,500 feet from the waterfront and two public highways, Pleasant Avenue and Shore Road, traverse the property between the pit and the loading wharf.

The first job facing the Wm. P. McDonald organization, naturally, was that of equipping the newly acquired pit for profitable operation. The former plant had been dismantled and removed, only some old concrete foundations remaining, so it was not necessary to decide whether or not to scrap or try to use existing, and possibly inefficient, machinery.

Inasmuch as the company had been operating a large inland pit at Port Jefferson, another glacial moraine some 40 miles east of the newly acquired property at Port Washington, ample experience had been gained by trying out certain new principles of sand pit operations.

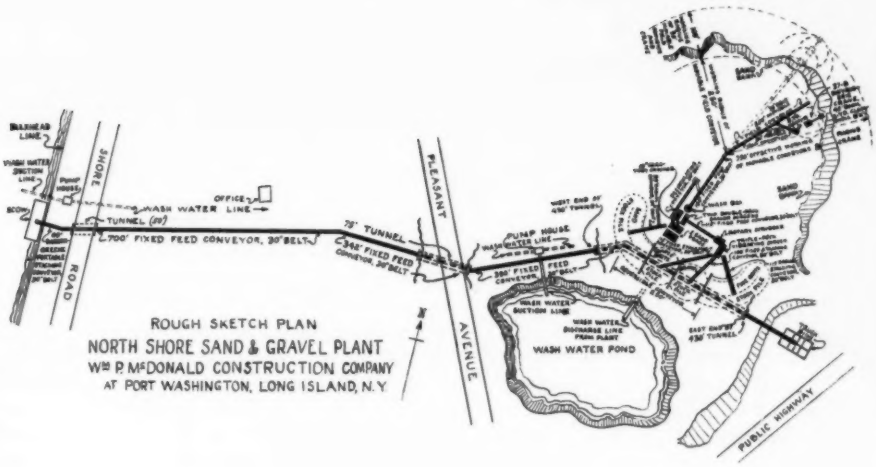
The first principle is that all operations must be as nearly automatic and continuous as possible. The second is that since outgoing loadings, whether by scow, railroad freight or motor truck, are necessarily intermittent, the in-

RSALE

tervals between loadings should not affect the excavating, cleaning and grading operations. Third principle is that there should be adequate sized and automatically conveyable stock piles to which the excavating, cleaning and grading plant can feed at all times and from which the outgoing loading system can draw as needed. The fourth is that equipment for the excavation and conveying of sand to the cleaning and grading plant should be easily and quickly movable from point to point; should be of such a type that sand-slides from a 75-foot bank would not bury or impede the working of the equipment; and should be capable of handling large yardages continuously and easily before needing to be moved to a new location.

To solve these problems it was decided to handle all internal transportation, from point of excavation to outgoing loading points, by means of conveyor belts at speeds of 350 to 450 feet per minute. For excavation, a 37-B Bucyrus-Erie crane with a 45-foot boom and a 2¼-yard clamshell bucket was chosen. The cleaning and grading plant was built up of various standardized units plus other apparatus specially designed by the McDonald organization for this operation.

The accompanying flow sheet gives the names and sizes of equipment and the sequence of operations. So completely automatic and continuous is the plant that the only hand labor involved is the hand-picking of oversized stones from the conveyor belt that feeds the cleaning and grading plant, and the semi-occasional "poling" of sand to start it flowing freely into discharge chutes.



● This sketch of the North Shore Sand & Gravel Plant layout shows the convenient arrangement of structures and equipment.

A glance at the sketch of the North Shore Sand & Gravel Plant will show what a huge sector of material to be excavated is made available by the use of the 37-B Bucyrus-Erie crane, the 50-foot movable conveyor and the 250-foot movable conveyor. The radius of this sector of available material is at least 350 feet. Figuring it as a semi-circle and with the depth of the bank varying from 50 to 75 feet, the easily reached yardage is at least 350,000 to 500,000 cubic yards or about six months' work.

Choose Crane for Excavation

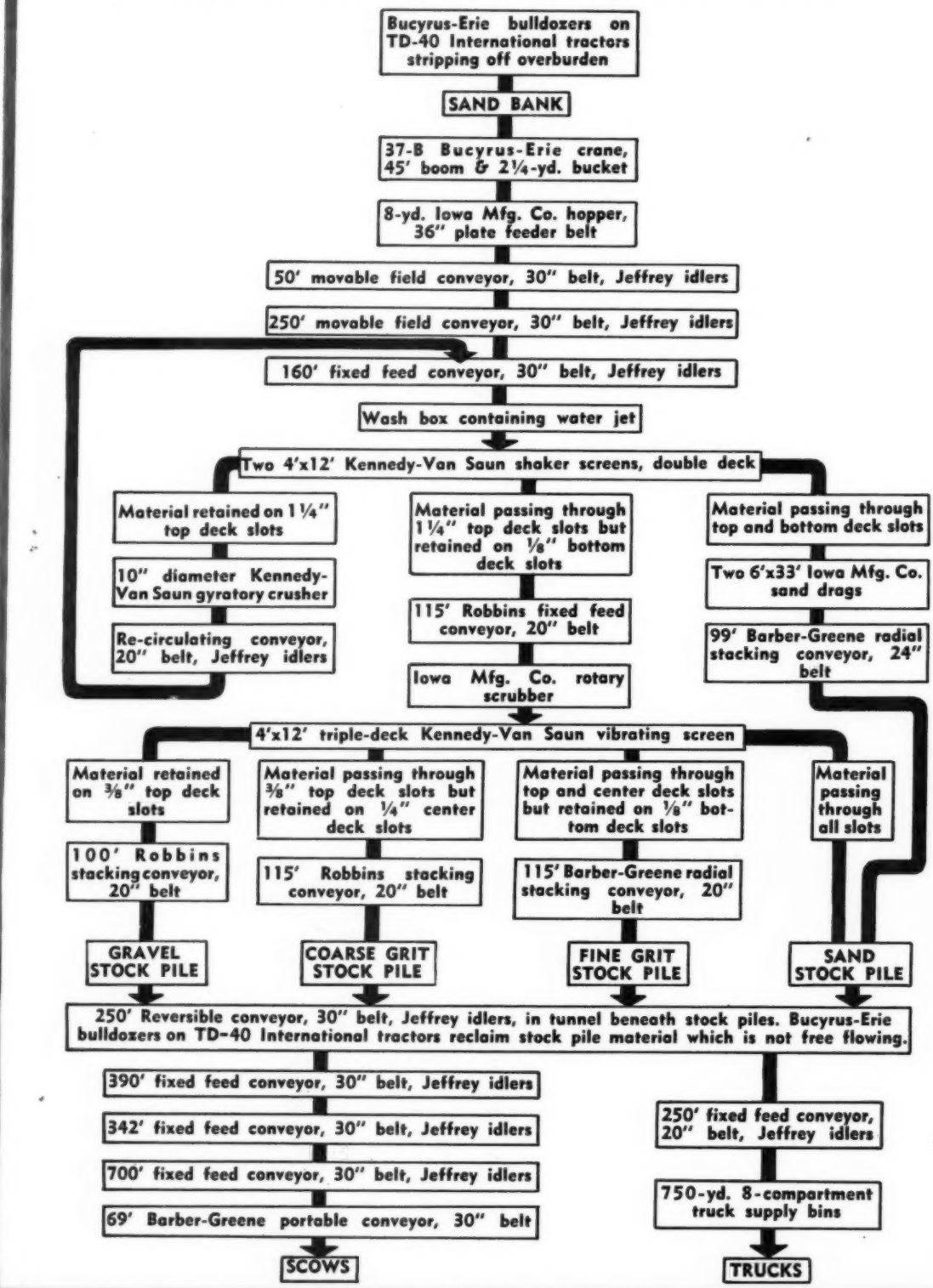
Choice of a crane for excavation was based on the fact that, with a 45° boom angle, a crane with a 45-foot boom could be kept about 37 feet away from the foot of the sand bank. This obviated all danger of having the crane buried in a sandslide and permitted the 2¼-yard clamshell bucket to be tripped easily over a feed hopper 15 feet high, giving, incidentally, a working radius of a trifle more than 74 feet from center of hopper to center of bucket. A 37-B Bucyrus-Erie crane was chosen because an unfailing production of 2,500 cubic yards daily was the basis of the plant design and the company's previous experience with Bucyrus-Erie equipment showed it to be conservatively rated with ample safety factors.

Results have been entirely satisfactory. Under skillful handling, the 37-B has operated continuously, eight or more hours per working day, since July, 1939, without breakdown. Production

● Panoramic view of the North Shore Sand & Gravel plant. The cycle of operations starts at the extreme right where a Bucyrus-Erie bulldozer shoves overburden over the sand bank to a Bucyrus-Erie 37-B clamshell which loads the material to an Iowa 8-yard hopper. From here a series of 30-inch belt conveyors carry the material through crushing, screening and washing operations. The various sizes of aggregate are stocked in separate piles by Stephens-Greene radial conveyors.

Flow Sheet

OF NORTH SHORE SAND & GRAVEL PLANT OPERATIONS


Bucyrus-Erie bulldozers on TD-40 International tractors stripping off overburden
SAND BANK
37-B Bucyrus-Erie crane, 45' boom & 2¼-yd. bucket
8-yd. Iowa Mfg. Co. hopper, 36" plate feeder belt
50' movable field conveyor, 30" belt, Jeffrey idlers
250' movable field conveyor, 30" belt, Jeffrey idlers
160' fixed feed conveyor, 30" belt, Jeffrey idlers
Wash box containing water jet
Two 4'x12' Kennedy-Van Saun shaker screens, double deck
Material retained on 1¼" top deck slots
10" diameter Kennedy-Van Saun gyratory crusher
Re-circulating conveyor, 20" belt, Jeffrey idlers
Material passing through 1¼" top deck slots but retained on ⅛" bottom deck slots
115' Robbins fixed feed conveyor, 20" belt
Iowa Mfg. Co. rotary scrubber
Material passing through top and bottom deck slots
Two 6'x33' Iowa Mfg. Co. sand drags
99' Barber-Greene radial stacking conveyor, 24" belt
4'x12' triple-deck Kennedy-Van Saun vibrating screen
Material retained on ⅜" top deck slots
100' Robbins stacking conveyor, 20" belt
GRAVEL STOCK PILE
Material passing through ⅜" top deck slots but retained on ¼" center deck slots
115' Robbins stacking conveyor, 20" belt
COARSE GRIT STOCK PILE
Material passing through top and center deck slots but retained on ⅛" bottom deck slots
115' Barber-Greene radial stacking conveyor, 20" belt
FINE GRIT STOCK PILE
Material passing through all slots
SAND STOCK PILE
250' Reversible conveyor, 30" belt, Jeffrey idlers, in tunnel beneath stock piles. Bucyrus-Erie bulldozers on TD-40 International tractors reclaim stock pile material which is not free flowing.
390' fixed feed conveyor, 30" belt, Jeffrey idlers
342' fixed feed conveyor, 30" belt, Jeffrey idlers
700' fixed feed conveyor, 30" belt, Jeffrey idlers
69' Barber-Greene portable conveyor, 30" belt
SCOWS
250' fixed feed conveyor, 20" belt, Jeffrey idlers
750-yd. 8-compartment truck supply bins
TRUCKS

● Mounted on an International TD-40 this Bucyrus-Erie bulldozer stock piles reclaimed gravel.

has been slightly in excess of 2,500 cubic yards per day.

Actual overburden excavation starts with the scraping off of the small amount of topsoil, roots and sod which overlies the sand. Removal of this thin overburden is done with Bucyrus-Erie bulldozers mounted on TD-40 International tractors. In a single day the bulldozers remove enough topsoil to allow two weeks of excavation work.

At the foot of the sand bank the 37-B Bucyrus-Erie crane, with its 2¼-yard clamshell bucket, hums industriously at its job of keeping an 8-yard Iowa Mfg. Co. hopper filled. About 1,200 bucketsfull a day is no great chore, but every once in a while there are interruptions to move the crane, the hopper or one of the conveyor belts. For the heavier moving jobs, a 34-B Bucyrus-Erie crane with a 50-foot boom and a 1¼-yard bucket is called on to help. Its chief job is the shifting of the 50-foot and the 250-foot movable field conveyors. The 34-B crane is also used for general utility purposes, such as hoisting, cleaning up around the plant, etc.

Both the 37-B and the 34-B cranes use ¾-inch Monitor 6x19 preformed Excellay wire rope, with independent wire center, for closing line. The cost is slightly more than the ⅞-inch standard wire rope formerly used, but the preformed wire rope lasts one month, whereas the standard wire rope lasted little more than a week on this type of work. The saving in reeving time alone justified the extra cost, not to mention the worth of the additional production.

Sand is discharged from the 8-yard hopper by means of a 36-inch plate feeder belt, which feeds onto a 50-foot movable field conveyor equipped with a 30-inch belt running on Jeffrey idlers at a speed of 425 feet per minute. The belt is 5-ply, 28-ounce, with ⅛-inch rubber top and 1/32-inch rubber bottom. This, and most of the other conveyor belts in the operation, were purchased from the New York Rubber Belting Company.

Practical Design Throughout Plant

Under the personal supervision of President Wm. P. McDonald; W. J. McLain, general manager at Port Jefferson, and C. W. Effinger, superintendent at North Shore, designed and built all the conveyors which feed the washing and sizing plant, as well as the conveyors which carry materials from beneath the stock piles to the truck supply bins and the waterfront. Designed, according to W. J. McLain, on the backs of envelopes, the belts, speeds and vertical curves result in a system that works smoothly, was economical to construct, and is economical to operate.

The 50-foot, hopper-fed, movable field conveyor discharges onto either side along the entire length of a 250-foot movable field conveyor. The actual shifting of these two field conveyors and the 8-yard

(Continued on page 616)

● Top: General view of the digging end of the aggregate reclaiming equipment. The Bucyrus-Erie 37-B has just started 2¼ yards of material over the conveyor belts. Bottom: Sand bound for New York City is loaded to a barge by a Barber-Greene portable conveyor.

Scenery + Saf

John Strona and Son of Pomona widen and straighten a 3.7-mile section of southern California's scenic coastal highway

BY JOHN R. MARCY

FOR MORE than 200 miles National Highway 101 follows the coastline of southern California. From San Diego to Santa Barbara and beyond, it is seldom out of sight of the Pacific Ocean, sometimes on the high bluffs overlooking the wide expanse, sometimes along the beach within a few feet of the tumbling surf.

It is on this scenic highway, one of the world's most beautiful drives, that John Strona and Son, of Pomona, are engaged in widening and straightening a 3.7-mile section. The road runs through the Rancho Topango, one of the old Spanish land grants, and the improvement is located just above Malibu Beach, where most of Hollywood's famous ones have built queer-looking "cottages" to which they come for relaxation, sea and sun, and escape from autograph seekers.

Not that that makes any difference to the men who are doing the road work, but it is a pleasant place in which to do it—same cool sea breeze, same sunshine, same ocean that the movie colony enjoys.

The contract price was $246,000 and work was begun in December, 1939, under the direction of Superintendent Harold Pope, with C. N. Ainley resident engineer for the California Division of Highways.

Widened From 2 To 4 Lanes

At present this section of the highway is a two-lane structure, most of it running within sound of the surf. This part is being realigned to eliminate curves and widened to four lanes. On each side of a central curbed dividing strip six feet in width will be two lanes, the inner, or passing strip of blacktop 11 feet wide with a 1-foot gutter and the outer of concrete, 11 feet wide.

Blacktop strips will be plant-mixed placed over 1½ feet of select material. The concrete lanes will be built with 2 feet at each edge of thickened construction.

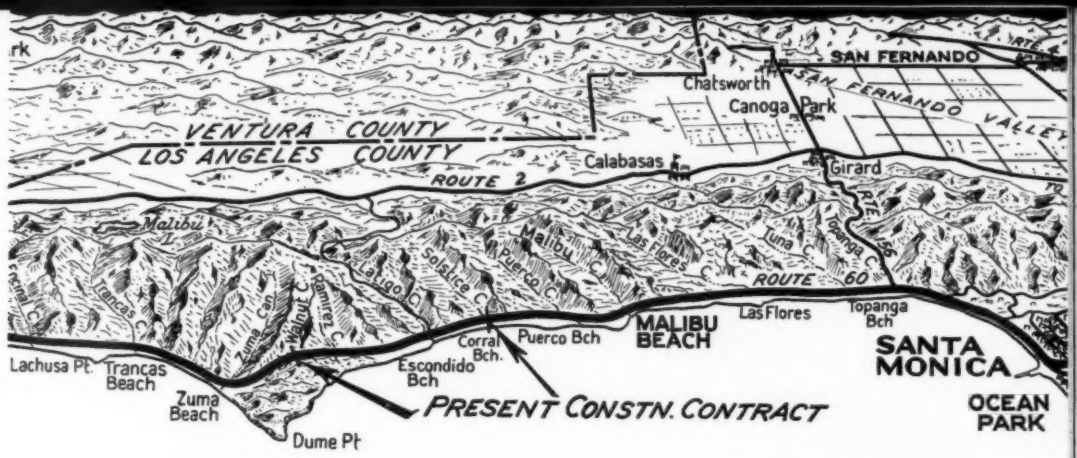
The new alignment eliminates three curves of 500 feet or under radius, seven curves with 1,000 feet or under radius, and reduces 14 curves with a minimum radius of 250 feet to five with a minimum radius of 2,500 feet.

Included in the realigning and widening is, of course, the preliminary work of constructing the graded roadbed and installing drainage facilities, which in this case means the major portion of the work. To date operations have been on these features.

Many creeks intersect the highway from the numerous flanking canyons, and although their beds are dry most of the year, they carry raging torrents during the rainy season, and have to be provided for. Several concrete bridge structures were built by the state under previous contract, but there still remain others which are a part of the present job. In all there were about $60,000 worth of these drainage structures, chief of which were 2 arch culverts 7x9 feet in diameter; one 8x10 culvert; and one 10x10 underpass. This latter will serve the double purpose of a waterway and a passage through which cattle may be driven under the road to reach the divided parts of the huge ranch intersected by the highway.

Under the numerous fills and for overside drains, some 2,200 feet of corrugated pipe is utilized. Of this pipe 1,900 feet is 24-inch, 240 feet is 30-inch, and 240 feet is 42-inch. Besides this there are numerous spillway structures.

● **Left: Equipped with sheepsfoot rollers and bulldozer blade, this Allis-Chalmers tractor works on road bed fill. Right: Wetting down fill on a section of the contract near the Pacific ocean.**



● California State Highway Department sketch showing location of the Strona contract.

Placing Roadbed Fill

Construction of the roadbed involves the handling of some 500,000 yards of material. This amount was originally estimated at a considerably lower figure, but chiefly because of the nature of the formations encountered, it was found that a greater yardage had to be moved.

The problem of obtaining suitable material for the subgrade proved to be one of the most serious presented by the whole job. Unexpected quantities of adobe and diatomaceous earth not revealed by the preliminary sampling, is the cause of the trouble. This material is not suitable for the roadbed, but it has to be handled. Suitable material occurs in pockets, and in order to obtain a sufficient amount within the radius of economical haul, more excavation than is necessary for the specified grades is required.

Toward the south end of the section there is plenty of good material, and although it's a long haul it may have to be used. Another possibility is the use of beach sand, of which there are copious quantities all along the section. A proper amount of this mixed with the adobe reduces swell and gives proper bearing value, according to Resident Engineer Ainley.

The adobe has caused trouble from another angle also. When the stuff is wet it resembles glue more closely than anything else, and it stays that way longer than any self-respecting soil should. For three weeks after the last rain it was still coming out in sticky chunks. For two months during the winter rains operations were shut down on account of it.

Material is being handled by two methods, scrapers and the shovel-truck combination. Three Woolridge scrapers of approximately 16 yard capacity are employed. Ordinarily a ripper is used to loosen the dirt and where the going is hard a pusher is used to assist the scrapers in loading. The average length of haul for the scrapers has been less than a quarter of a mile. While the economically feasible distance for scrapers depends to a certain extent on the particular conditions of the job, it is usually agreed that for much over that distance the shovel and truck is better adapted. There are, of course, conditions under which the latter is better at any distance.

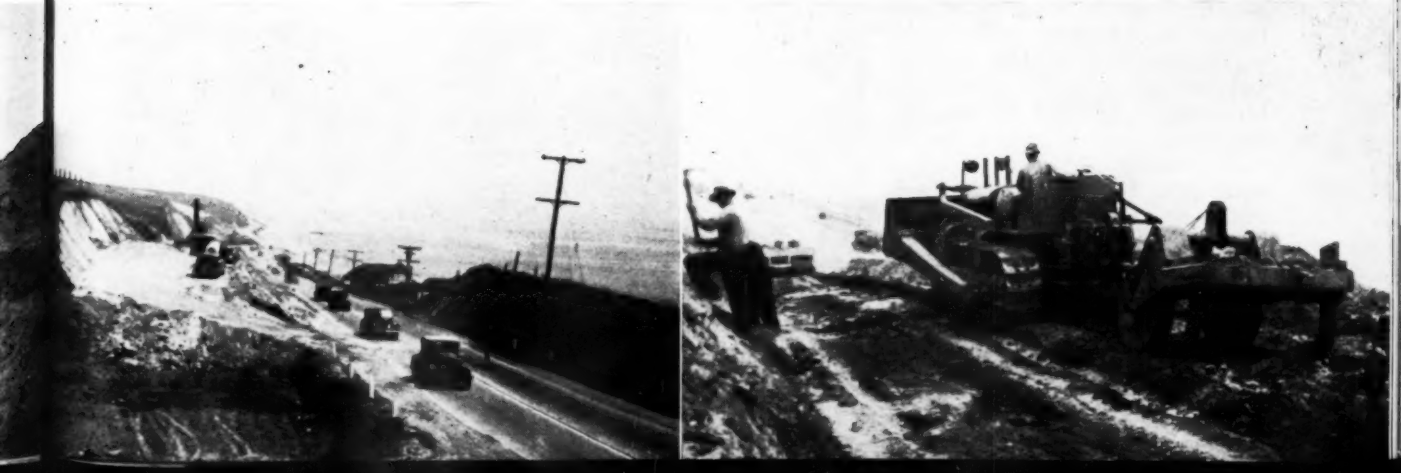
Tractors Turn in Good Performance

All the tractors on the job are Allis-Chalmers. There are seven in all, five of which are L and LO's, and two of the new HD 14's. The best place to find out about a new piece of equipment is from the men who are operating it on actual construction, and from the approval accorded this tractor by the men here, it apparently has something.

These new models have been in continuous operation here under conditions which can easily be classified as tough, without a moment's hesitation, which speaks well enough for their ruggedness. "I believe these new General Motors diesels, with which the A. C.'s are equipped, are going places," remarked Superintendent Pope. "They're the best I've seen, and you're going to see them in wide use before very long."

There are two shovels on the job, a P&H ¾-yard rigged as a dragline being used chiefly for structural excavation and the other, a Northwest 2-yard, for

● Left: A constant stream of traffic passes as a shovel cuts through a hill for the new road bed. Right: To facilitate scraper loading a ripper is dragged over the grade.



● A Wooldridge scraper dumps its 16-yard load on the fill. Three of these units were used on the job.

loading the trucks. The truck fleet consists of eleven Fords of about 5 yard capacity.

Production varies, of course, according to conditions, but the average amount of dirt being moved by scrapers and trucks together is around 3,500 yards per day, although there have been days when the books show records as high as 4,600 yards.

Dirt is dumped on the fills and spread in 8-inch layers, sprinkled by hand-hose for proper moisture content, and then compacted with sheepsfoot tampers. A somewhat unusual combination is being employed here which saves the extra tractor ordinarily used for spreading the material. The tractor that pulls the tamper is equipped with a bulldozer, which enables it to handle both the spreading and tamping. This, of course, would not be practical on long fills, but here, where most of the fills are deep and comparatively short, it seems to work admirably. It is also feasible because of two additional factors, the speed and maneuverability of the tractor, and the fairly light weight of the tampers, the sheepsfoot assembly consisting of but four units.

No blasting has as yet been necessary, but it is anticipated that some will have to be done on the lower end of the section.

Water for the job is supplied from a well located about half-way along the section which is part of the water system of Malibu Beach. It is piped along the stretch and pressure is obtained by means of a booster pump.

Job Precautions Boost Safety

To date there have been no serious accidents, either among the men engaged in construction or on the highway from the heavy traffic which constantly streams past operations. Constant and thorough precautions are taken to reduce this traffic hazard. It has been necessary in a few places to construct temporary roads around construction, but for the most part the problem is taken care of by red-coated flagmen who control the stop-and-go whenever it is necessary for trucks to use the existing highway. Adequate barriers are placed at all obstructions, and at night flares are kept burning around the obstacles.

All minor repairs are taken care of in the field shop which has been set up near the center of the section. Between shifts equipment is greased in the field by means of a grease truck outfitted with compressor, Alemite system, drums, and all necessary service facilities. This rig was assembled on the job, an old but serviceable light truck being used for the purpose. At night all mobile equipment is pulled into the shop and serviced under the lights. At this time also it is given mechanical inspection and minor repairs made. Since operations are shut down on Sundays, this time is also utilized for maintenance service.

Work is carried on in two seven-hour shifts through a six-day week. During the present operations, about 60 men have been employed on the job and to date 80,000 man hours of labor have been used. When paving begins a much larger number of men will be required.

To date work has been on the construction of the roadbed, which is now about 75% completed, over 450,000 yards of material having been moved. Progress is well within schedule, and at the present rate work will be completed easily within the allotted time of December 1, 1940.

● There was nothing wrong with the location of the resident engineer's office on this job. Sunshine and cool sea breezes were plentiful, with the Pacific ocean for a back yard.

"Johnny! What did mother say about digging holes in the yard?"

"Remember once more up to the curve—then we gotta' go back to work."

"I think he got the idea lookin' at them billboards."

"Pine Centre? Follow me sister, an' I'll take ya' right there!"

"They telephoned they wanted those blueprints over at the main office in a hurry, so I gave Sneeds a stick of dynamite, to make him hustle!"

"Lemme off at thirty-third street, conductor."

Milk Insurance

Good roads, provided by Wood County highway commission, insure prompt delivery of the county's chief product

WHEN driving through Wood County in central Wisconsin the traveler is impressed with two things. One, that this section is thickly populated with cattle and is unquestionably a dairy center. Huge pastures, carpeting soft rolling hills, are spotted with herds of fine guernsey milkers and only occasionally can one glide by farms where crop raising is of equal or greater importance than the production of milk and its by-products.

The other impression is gained by the unusual red hue of the unpaved roads and highways. Wood County has 160 miles of concrete highway and 1,313 miles of other hard surfaced roads which are substantially good for tourist travel but over 950 miles of country trunk lines and town roads are maintained as gravel roads and these we find covered with a red gravel which seems purposely tinted for the tourist's benefit.

Good Roads Prevent Milk Spoilage

How closely these roads and the dairy industry are allied the ordinary observer cannot appreciate. Milk and its by-products are perishable and must move fast from farm to producer so, consequently, the county road program is obliged to maintain good and fast routes at the lowest possible cost. The commission's problem for a constant supply of good road surfacing material is conveniently solved by the abundant sources of decomposed red granite at choice locations throughout the county.

A landowner having a bed of this material on his property is extended a county contract offering ten cents for each yard of finished gravel removed from his land. The land is generally useless anyway because of the rough and rocky character of the hills containing this rock. In all cases this plan has worked to the satisfaction of both the owner and Wood County and, in many instances, these contracts have rescued farms heavily burdened with mortgages.

The latest deposit of decom-

● A 1-yard dipperful of decomposed red granite is dumped in the crushing plant hopper by a Bucyrus-Erie shovel.

posed red granite to be opened is known as the "Howard Pit" and is situated off County Trunk N about one-half mile west of the corporated village, Bethel. The Wood County highway commission has secured a five year lease for the removal of any and all gravel contents in this area.

No stripping has been necessary thus far because the surface earth is negligible and is either cast aside or mixed into the gravel. A little earth in the mixture tends to hold the crushed stone together especially after it has been levelled and graded on old road surfaces. Later, of course, the dirt dries and is blown by winds or passing traffic.

Loading Out the Gravel

Loading is handled by a Bucyrus-Erie 1-yard shovel powered by a Caterpillar 92 h.p. diesel engine. This machine, a model 29-B, is the successor to a Bucyrus-Erie 1030 which had been doing this kind of work since 1929. Veteran operator Hilmer Holberg guides the machine through its paces and dumps the red granite into the three yard hopper of a Pioneer Model 38-V crushing plant which separates, crushes and loads the finished product via a series of composition rubber belts under the guidance of operator Gus Stake. The crushing plant, consisting of three units, is portable and is capable of handling 600 yards of material in an eight-hour day. Belt driven power is furnished by a 61-69 h.p. Caterpillar diesel engine mounted on a steel frame supported by four Firestone-tired wheels. The diesel engine consumes about 17 gallons of fuel in an eight hour day.

Finished gravel, uniformly crushed, is loaded into five FWD 4-5-ton trucks. The newest of these sported a General Motors diesel engine while the others were powered by heavy-duty Waukesha gasoline motors. Each truck carries five yards of gravel on an average haul of 1½ miles. The efficient operation and output of the crusher-loader is insured by keeping an extra truck on hand in case!

No special preparation was made before dumping the crushed stone on County Trunk N which was being repaired at the time of the writer's visit. Grading and spreading was accomplished with an Adams which levelled the material from three-inch depths at the shoulders to a thickness of about six inches at the center. Rolling or tamping was omitted because the material settled down to a firm smooth bed and neatly eliminated holes and "washboards." When one of these roads becomes well-travelled, oil, or bituminous is applied for conversion into a better class of thoroughfare.

Resurfacing ½-Mile Per Day

These renovated byways are laid down at a merry clip of half mile per day with each half mile requiring well over 500 cubic yards of crushed granite. Road repairs from this pit may extend to a twelve mile area with the addition of more trucks. The county commission, anticipating such moves, has ordered four new GMC trucks to complete its fleet of trucks. Quite obvious is the acceptance and installation of heavy machinery. No machine is too light or underpowered. Maintenance is the keynote for continuous and efficient operation. Wadham's "Mobil" and "Mobilgas" are used exclusively as fuels on all power units used for Wood County highway work and standard all-purpose gear lubricant is employed in the Alemite force feed guns. Wood County Highway Commissioner Ray Brayback aptly describes his county's maintenance schedule in saying, "Our equipment is checked and lubricated constantly so that no serious breakdowns can develop. If

(Continued on page 618)

● **Wood County's successful road program is largely due to the planning and management of County Highway Commissioner Ray Brayback.**

● **Left: Material dumped into the three-yard hopper of the Pioneer crushing plant is separated, crushed, and loaded to trucks at the rate of 600 yards every eight hours. Right: Finished gravel, hauled by trucks from the crushing plant, is spread with an Adams grader.**

Rolling Service Station

Gunther and Shirley employ modern servicing methods to keep their dirt moving equipment rolling at Prado Dam

By FLOYD SUTER BIXBY

ONE OF THE things which causes a headache to contractor's superintendents is the problem of fueling and servicing the heavy earth moving equipment used on earth fill projects. On most of the jobs a repair shop is erected some distance from the work. Facilities are sometimes included in connection with the shop for the fueling and lubrication of mechanical units used on the earthwork.

On these jobs, while heavy equipment takes time out to lumber into the yard to be serviced, the fill operations slow up. Compaction equipment catches up with dumping equipment. The fill foreman cusses and loses his temper, the fill inspector follows the foreman, and the contractor loses money all the while.

Station Follows the Equipment

Prado Dam, being built by Prado Constructors for the U. S. Engineers near Los Angeles, California, is not one of these jobs. Everett Seabury, the superintendent for Gunther and Shirley, contractors doing the earthwork on the dam, has solved this problem simply and quite effectively. Superintendent Seabury has devised and built a rolling filling station; a sort of super de luxe affair which fuels, lubricates and services heavy dirt moving machinery capable of grabbing 25 cubic yards at a mouthful. More important is the fact that he services it for less money than it normally costs to drive your automobile to the corner service station and say to the attendant, "Fill 'er up, buddy. Better grease it and change oil, too."

If you have a mania for facts, Seabury can show some in line with the results he has accomplished which, though not considered dangerous to your high blood pressure, will at least provoke a mild "well, well" or an "I'll be damned" if you're one of the old timers. He has added a total of nine hours to the effective working time each day of his equipment. He has cut the cost of routine service to $4.12 per unit per service. And he has found a way to service a Caterpillar D8 diesel tractor with 2 tandem 25 cubic yard Wooldridge scrapers in as little as 11 minutes.

With something like 3,000,000 cubic yards of earth fill which had to be excavated from the borrow pit, hauled to the dam and processed, the contractor moved in the following fleet of dirt equipment:

14 Caterpillar diesel D8 tractors
10 Wooldridge 25 cubic yard scrapers
2 White water trucks
6 International dump trucks
2 Southwest 6 drum cylindrical spike rollers
2 Scarifiers
1 Caterpillar Auto Patrol

From that point the battle belonged to Seabury, whose main problem was to cut servicing time to a minimum and improve his position from there on.

The base yard averaged 1,400 feet distant from the fill and excavating operations, and to move equipment to the yard to be serviced would naturally result in too great a loss of working time. "Why not build a service unit capable of going out to the equipment?" Seabury wondered.

He bought a large six year old flat rack type White truck, capable of hauling five tons of servicing machinery, fuel and lubricating supplies, over the rough terrain on which fill and excavation was to be done.

Unit Completely Powered

A Ford V-8 motor was anchored to the bed of the truck to furnish auxiliary power for air compressing and electrical units. The fan shaft was equipped with a double

● Fill placing equipment at Prado Dam is constantly serviced from a specially outfitted White truck.

• Sunday morning means servicing time for the Gunther and Shirley dirt handling machinery which stands in the company yard waiting the attentions of the service truck.

grooved pulley. One of the belts from the shaft turns an electric generator and one powers the air compressor.

A 3½ H.P. Gardner-Denver upright compressor was installed alongside the Ford motor. This compressor furnishes 150 pounds of air pressure, which is distributed from the main air tank mounted on the truck bed to the other tanks containing diesel fuel, lubricating oil and grease. Pressure is maintained on fuel, water, oil and grease while it is being dispensed to the equipment being serviced. Alemite zerck type fittings are used on one of the 40 foot hoses, and the other hose contains a giant button-head type of fitting which is used to grease the track rollers of the Caterpillars.

Southern California can be dark and adequately cold, especially on winter nights, to render lubricating oils and greases sluggish and viscuous, despite anything put out to the contrary by the Los Angeles Chamber of Commerce. With this in mind, Seabury installed a 2-kilowatt General Electric generator, to be driven by a belt from the fan shaft of the Ford motor. This generator was adequate to pull the necessary lights for servicing equipment at night. A rheostat-equipped resistor was also run off the generator and used to heat the grease in the dispensing unit until it would flow freely through the fittings.

When an air tank and two water tanks were installed, and a shield was built over the V-8 motor, air compressor and generator, the truck was ready for use.

During the servicing operations of an average day, when the equipment listed is all serviced, the truck dispenses 1,300 gallons of fuel oil, 100 pounds of lubricating grease, and 15 gallons of diesel lubricating oil. Sinclair "Tenol" is used for lubricating all the diesel equipment at this time. Equipment is serviced once every 12 hours, and fill is built on a 24 hour daily schedule, exclusive of Sundays.

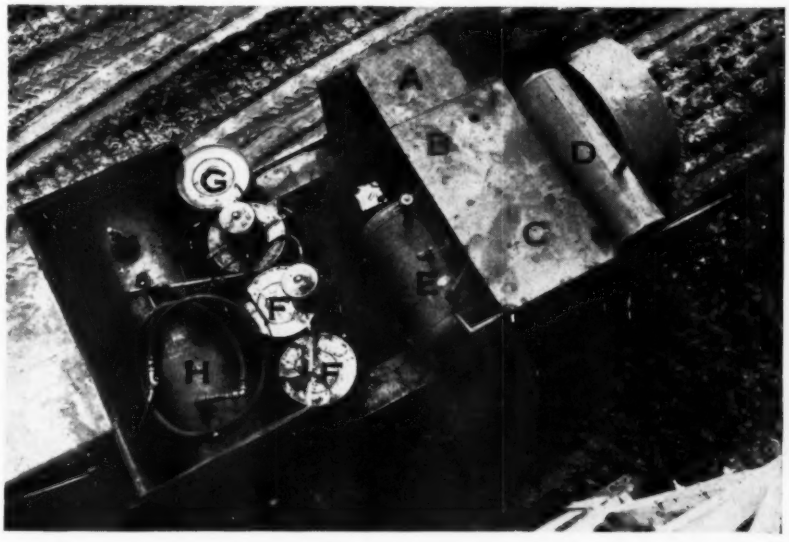
Cost Breakdown of Service

Following is a cost breakdown of the service truck for an average day:

Labor (2 oilers at $6.64)	$ 13.28
5 gals. gas for Ford V-8 motor	.60
Rental on White truck and auxiliary equipment	10.00
1300 gals. diesel fuel at $0.06	78.00
200 lbs. grease at $0.12	24.00
30 gals. diesel lubricating oil at $0.62	18.60
Total daily cost	$144.48

Superintendent Seabury knows, of course, that the expense of servicing a tractor is just as great with his rolling service station as the cost would be if his service station were permanently located in his base yard. He saves little or nothing on the actual servicing cost. But when his service truck rolls up to a carryall line coming from the borrow pit, he knows that each of those big carryalls and tractors will save at least a quarter of an hour by not having to run into the yard to be serviced. And on a job where a quarter of an hour represents a round trip with 50 cubic yards of pay dirt . . . well, you figure it out.

• A bird's eye view of the service truck reveals the following conveniently placed equipment: (A) Ford V-8 motor, (B) GE generator, (C) Gardner-Denver compressor, (D) water storage tank, (E) air storage tank, (F) lubricating oil drums, (G) grease drums, and (H) 650 gallon capacity fuel tank.



EXCAVATING ENGINEER

FOUNDED 1905

A Monthly Publication

Devoted to the Excavating Industry

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

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Defense Work Increases Construction Activity

Construction activity reached a ten-year peak in August. Not since June, 1930 have contracts awarded in the 37 eastern states exceeded last month's total of $414,941,000, according to recent reports from F. W. Dodge Corporation. The August total of residential building contracts, $152,988,000, was the highest since July, 1929 and exceeded the August, 1939 total by 20 per cent.

Construction undertaken under the National defense program was responsible for a large portion of the increased volume; it brought the total volume of public construction contracts up to $195,293,000 compared with $158,459,000 in August of last year. However, private construction contracts increased from $153,869,000 in August, 1939 to $219,648,000 last month, a 43 per cent rise. This $68,000,000 increase included a $29,000,000 increase in manufacturing building contracts ($10,369,000 in August, 1939; $39,586,000 in August, 1940) consisting in considerable degree of plant expansion stimulated by defense orders. However, there were also substantial increases in private, commercial and residential building contracts.

The impetus given to construction by the defense program has just begun to be felt, and some defense requirements have not yet been taken care of in appropriations made to date. It should be noted also that the figures given in this statement do not include a number of large defense projects on the West Coast and in colonial territories, both of which are furnishing an augmented market for materials and labor. Undoubtedly, total construction volume for 1940 will exceed by a substantial margin the estimates which were current at the beginning of this year.

Sell Good Roads

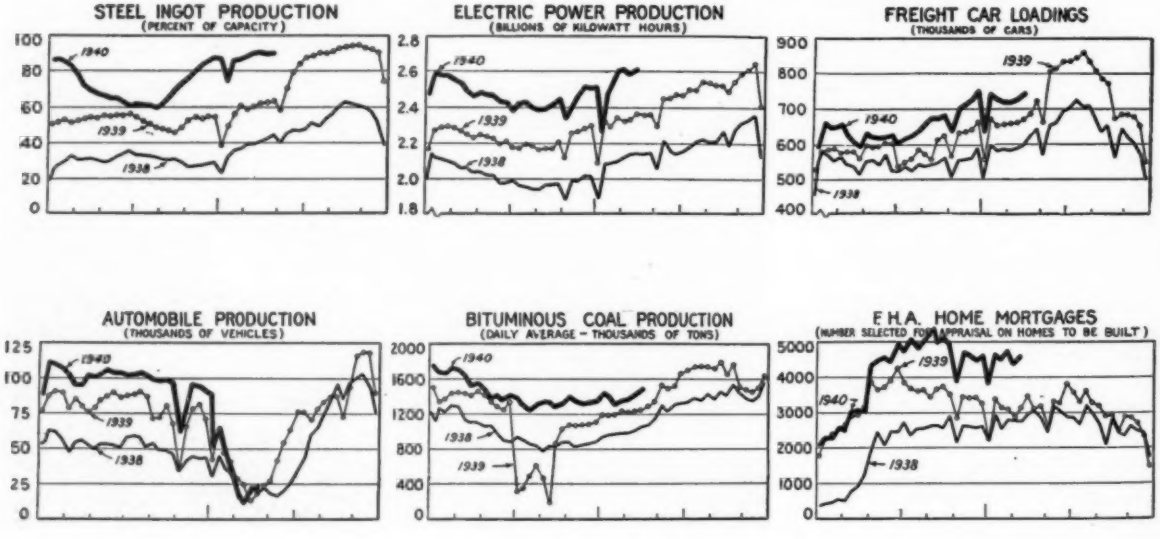
Would you think that as much as we use our highways in this country, somebody would have to sell them to us? But that is exactly what has to be done, according to Robert E. Harper, director of public relations of the American Road Builders Association.

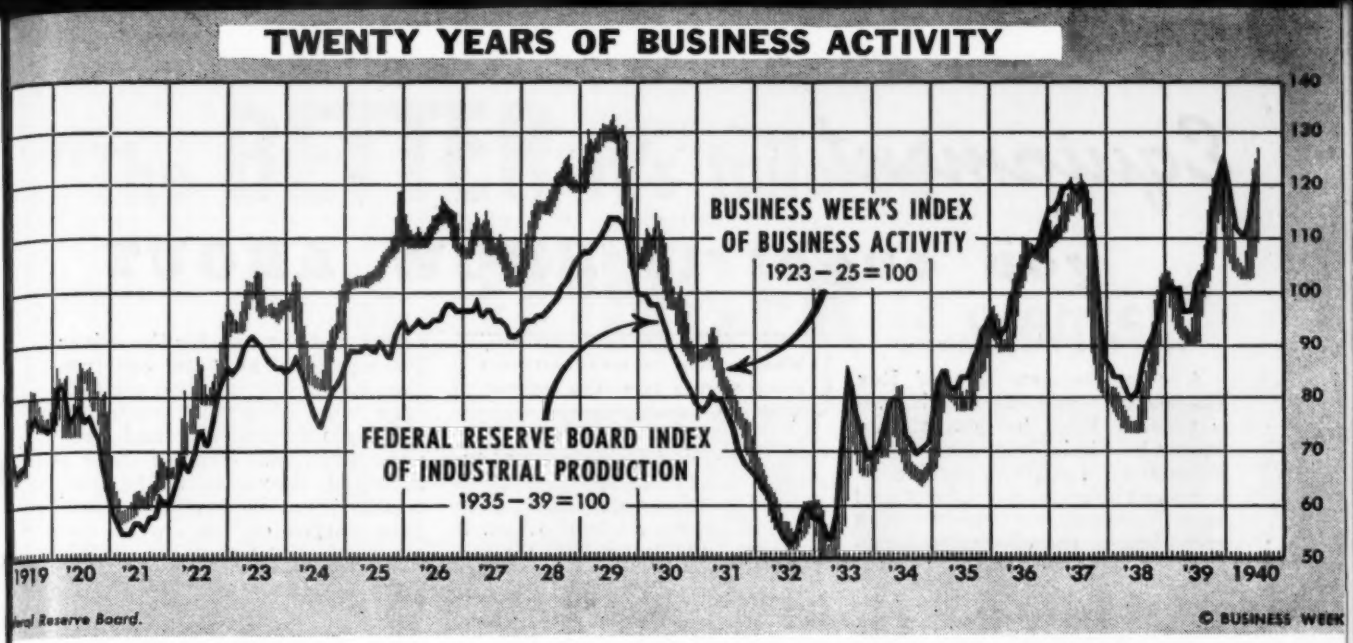
"Fortunately," said Mr. Harper, "road builders have an ever increasing buying public, the highway user, millions strong. He is the buyer and owner of roads. But every good sales manager knows that satisfaction in ownership evolves from the pride of ownership. Every successful sales campaign appeals to that pride, that desire to own the best, that conviction of extra value received.

"How many people know that it costs two cents more per mile to operate a vehicle over a bad road than it does over a good road? How many laymen honestly know what a vertical curve is and how dangerous it is? How many people know that 100,000 miles of our highway road system are obsolete? How many people know that there are ten times as many automobiles in the United States as there were in 1916, whereas we have only managed to double our hard-surfaced mileage in the past ten years? These are just a few of the questions that must be answered satisfactorily.

"Is there any reason why the public shouldn't be given the answers, why it shouldn't be satisfactorily sold on good roads? Why shouldn't he point with pride and say, 'That's my road. I helped buy it. I know what it cost. I know what service it will give. I know who built it. I know what's in it. It's safe. It's the best that money can buy. It's mine. I own it.'"

WEEKLY BUSINESS INDICATORS





● The above combination of two well known business charts gives a pretty accurate record of American industrial and business activity for the past 20 years. In these changing times it might be a good idea to clip this graph for handy reference when hazarding an estimate of future business conditions. (Chart courtesy of Business Week.)

American Credo

I was born an American; I live an American; I shall die an American; and I intend to perform the duties incumbent upon me in that character to the end of my career. I mean to do this with absolute disregard of personal consequences! What are the personal consequences? What is the individual man, with all the good or evil that may betide him, in comparison with the good or evil which may befall a great country, and in the midst of great transactions which concern that country's fate? Let the consequences be what they will, I am careless. No man can suffer too much, and no man can fall too soon, if he suffer, or if he fall, in the defense of the liberties and constitution of his country.

—*Daniel Webster.*

Let's All Do Our Share!

The prompt, efficient manner in which the American Red Cross has met great disasters in the past has made its emblem a symbol of mercy and humanity. At home its armies of volunteers, working tirelessly at scenes of flood, tornado or other catastrophe, meeting the challenge of misery and want, have earned the recognition of their fellow beings. Abroad, the American Red Cross enjoys the respect and friendship of all who have come to know it, and there are many such.

The strength of the American Red Cross and, therefore, its effectiveness and the results it obtains, lies in its membership. But strength alone is not enough. Public confidence, as reflected in a growing membership, also is essential.

The United States today is in a privileged position to extend help to those who have suffered so severely from the present war. Little children who look to the Red Cross cannot be turned away. Their elders, bewildered by the rapidity of catastrophic events, must be helped. Unlike most other attributes, mercy may be translated into action by dollars and cents. The necessities of life, food, clothing, shelter and medical treatment, can thus be made available. And, thanks to the generosity of the American people, who contributed more than $20,000,000 to the Red Cross war relief fund last summer, orphanhood and homelessness, hunger and sickness, are being cared for.

The programs of community service, developed by the 3,715 chapters, and which include assistance to disabled veterans, public health nursing, first aid and water safety instruction, production of reading matter for the blind and a host of others, must be continued without let-up and expanded as needed. The national organization must be ready to cope with disaster whenever and wherever it strikes.

The $20,000,000 raised and earmarked for war relief may not be diverted to other Red Cross activities. There is, therefore, but one way to maintain the organization's effectiveness at home: the strength of the Red Cross, as reflected in membership, must be increased.

The annual Red Cross Roll Call occurs from November 11 to November 30. Last year during that time more than 7,000,000 men and women enlisted under the Red Cross banner. Their dues enabled continuation of the many community and national services, and the expenditure of almost $2,000,000 for war relief before the nation-wide appeal for funds last May.

This year that 7,000,000 figure must be increased. Demands at home are growing. Humanity overseas cries aloud. Join your local chapter! Help raise that figure to eight, nine or ten million!

Equipment you ought to KNOW ABOUT

New Rex Moto-Mixers

A complete new line of Rex Moto-Mixers and Moto-Agitators is presented to the concrete industry by Chain Belt Company of Milwaukee. Designed specifically to make the most of the increased carrying capacity of modern high speed trucks, these new Rex Moto-Mixers promote faster loading,

faster and better mixing and have the added advantage of greater carrying capacity, according to the manufacturer.

Eliminating the need for stopping the drum to change gears, the new Rex Moto-Mixers offer the Rex twin clutch transmission wherein one lever controls all speeds from high to low and in-between. Optional, at slightly higher cost, are the Rex pneumatic controls which give the driver finger-touch control of drive speeds from his seat in the cab. Another feature of the Moto-Mixer is the new no-leak Rex discharge door which is definitely leakproof, maintaining true alignment with the drum at all times. It is operated from the mixer or from the ground by a non-creeping hand-wheel.

For further information concerning the design, construction and sizes of the new Rex Moto-Mixers, address Chain Belt Company, 1609 West Bruce Street, Milwaukee, Wisconsin.

Small Tournapull Introduced

R. G. LeTourneau, Inc., manufacturers of tractor-drawn earth-moving equipment have recently developed their third and smallest Tournapull, known as the Model C, for long haul dirt moving.

Powered by a "Caterpillar" four

When writing to manufacturers please mention Excavating Engineer.

cycle, six cylinder D-468 diesel engine, it has a top speed of 13 to 15 miles per hour, depending upon tire equipment. At 1800 r.p.m. it develops a maximum brake horsepower of 90.

To give the greatest possible traction per pound of weight, the entire weight of the engine and half of the weight of the Carryall scraper and its load are placed on the two large pneumatic tired drive wheels by the elimination of front wheels. The Model C is designed to work with the Model LS Carryall scraper which has a struck capacity of 8.2 cubic yards.

Steering is accomplished by independent operation of the two drive wheels, each controlled by a slow-speed, heavy duty, double cone clutch, using a metal lining

running in oil. According to the manufacturer, this type of steering and the resulting close coupled unit make for short turning and easy maneuvering in tight quarters.

For further information on the new Model C, send your request for Form TD-103 to R. G. LeTourneau, Inc., Peoria, Illinois, or any of their branch offices or dealers.

Truck Tractor

In announcing production of the new tractor model LMT, a unit designed expressly for tractor service, Mack Trucks, Inc. offers to the automotive field a tractor built to haul a maximum gross train weight of 60,000 lbs.

The streamlined cab of the new model LMT Mack tractor features safety and comfort for the driver. The cab is of all-metal construction, has a slanting, two piece, V-type windshield with each part opening independently and being adjustable. Shatterproof glass is standard throughout. The LMT is offered in the standard wheelbase length of 140" with such standard equipment as double-

acting hydraulic shock absorbers on front, airbrakes, semi-trailer brake, and electric connections.

The LMT is powered by the six-cylinder model EP Mack Thermodyne engine with 4¾"x5¾" bore and stroke developing 160 h.p. at governed speed of 2100 r.p.m. Total piston displacement of this engine is 611 cu. in. In place of this Mack EP engine which is standard in the LMT, Mack is also offering, at extra charge, the larger model EY Mack Thermodyne engine of 707 cu. in. piston displacement, an engine which develops 175 h.p. at governed speed of 2000 r.p.m.

For further information on the new LMT address your request to Mack Trucks, Inc., 34th Street & 48th Avenue, Long Island City, New York.

New Air Hose

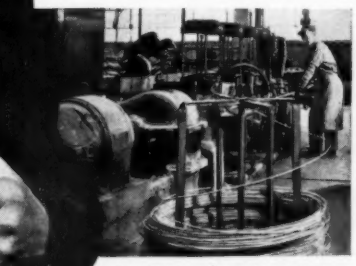
Recommended for use where excessive hot oil conditions are encountered, The B. F. Goodrich Company, Akron, Ohio, announces the addition of a new air hose made with a synthetic tube and rubber cover. It is known as Type 54.

Laboratory tests indicate that the synthetic tube used in this construction should give two to three times longer service life when exposed to the same condi-

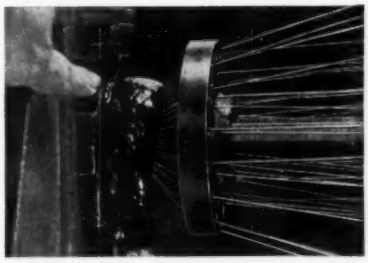
"The BETTER it's tailored the LONGER it wears!"

If you keep performance records on both ordinary wire rope and Macwhyte Steel-tailored rope, you'll actually SEE (as you can here): how Macwhyte steel-tailored rope outlasts ordinary rope by a *wide* margin. Let me show you why:

FIRST, there's DESIGN Tailoring. Macwhyte men are *specialists* with years of experience in the laboratory . . . the ropes they make are designed to meet your *specific* problems. That's why Macwhyte Ropes LAST so long, why they're so profitable to use.



THEN there's STEEL Tailoring. The steel used in Macwhyte ropes is not ordinary steel. And every process through which it goes... laboratory tests, heat-treating, baking, wire drawing . . . is done with hair-line accuracy by master workmen.



FINALLY, there's PERFECT FITTING — exact, synchronized strand FITS PERFECTLY and is FULLY PROTECTED in the finished rope by special Macwhyte lubricant, specially designed to ward off corrosion and internal friction.

BUT THAT ISN'T ALL! Macwhyte engineers the year 'round check performance on *all* kinds of jobs. They find out what rope does best on a specific job. That's why they can recommend for your specific job a rope designed, made, and field-proved to give you maximum service. In short, Macwhyte wire rope is "steel-tailored" to give you longer wear at considerably less cost. Try it.

NO. 442

MACWHYTE COMPANY

Kenosha, Wisconsin, Manufacturers of Wire Ropes and Braided Wire Rope Slings for every use. (Distributors throughout the U. S. A.) New York... Pittsburgh . . . Chicago . . . Ft. Worth ...Portland...Seattle...San Francisco.

MACWHYTE

Whyte Strand

PREformed WIRE ROPE

The Wire Rope with THE Internal Lubrication

LABORATORY TESTED—FIELD PROVED

For your convenience in writing to Macwhyte Company, you will find a card bound in this issue.

tions as a tube made of natural rubber. The hose is built with a smooth green abrasion resistant cover. For further information write to The B. F. Goodrich Company, Akron, Ohio.

Tamper Tips

A two-piece cast steel tip for dirt and rock tampers is announced by Los Angeles Steel Casting Company, Los Angeles. Important savings in metal, cost and time are claimed for these

patented "Tamprite" tips.

Bases are made of special nickel steel that has excellent welding qualities and great strength and the tips are made of chrome molybdenum steel to resist abrasion. The long tampered shank on the base provides ample surface contact with the socket of the tip. A flat register in the socket engages with a flat area on the shank and prevents the tip from turning. After the bases are welded onto the tamper drum, subsequent cutting and welding are entirely eliminated. When replacements are needed, the worn tips are driven off and new tips are driven on. Renewals can be made in the field, on the job, without expensive equipment and lost time.

For further information write the Los Angeles Steel Casting Company, Los Angeles, Calif.

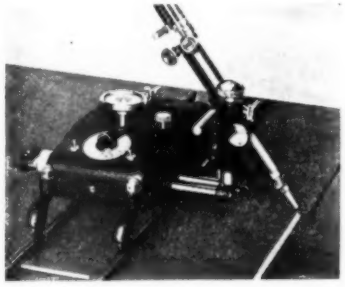
New 31-Pound Sinker

A new, light sinking drill, known as the S-33, has just been announced by Gardner-Denver, Quincy, Illinois. It is designed to combine exceptionally light weight with the speed and power ordinarily associated with much heavier drills. The manufacturer says that this 31-pound sinker is specially made for close quarter work where excessive weight is a handicap. The S-33 may be easily held in any position for chute blasting, plugging and hitch-cutting.

Its power and speed are largely due to the four-pawl rotation, instead of the two-pawl generally used in this weight class. The pawls are reversible for double wear and a special spring eliminates the necessity of pawl plungers. These springs are conical and wound from flat spring stock. The exhaust control valve when closed diverts live air at full line pressure to clean the bottom of the hole. Additional information will be found in Bulletin S-33 which may be had upon request from the Gardner-Denver Company, Quincy, Illinois.

Portable Cutting Machine

The Harris Calorific Company, Cleveland, Ohio, announce their new and improved model "K" portable, motor-driven gas cutting machine. An efficient unit for cutting steel of light or heavy section it enables metal working shops, maintenance engineers, and manufacturers to replace costly castings, forgings, and broken



machinery with parts quickly flame-cut from inexpensive and readily accessible steel plate.

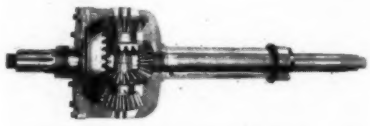
The Harris model "K" is powered by a Universal electric motor and will cut straight lines of any length, with square or beveled edges; 1" to 86" diameter circles with standard equipment; possesses an exceptional speed range from 3" to 60" per minute, forward or reverse. An instant stop feature (no over-run) permits cutting of sharp angles, and a tracing feature provides for cutting irregular forms. Convenient switch permits the machine to be reversed instantly.

Many different Harris torches are available for this machine to efficiently use acetylene, propane, natural gas and other fuel gases in combination with oxygen. When writing for further information ask for illustrated folder E-24.

New Differential

A new power proportioning differential especially designed for six-wheel drive trucks has been announced by H. B. Dodge, chief engineer of The Four Wheel Drive Auto Company of Clintonville, Wisconsin, FWD truck manufacturers.

The new power proportioning differential is used in the power line of six-wheel-drive trucks and distributes the driving power to each axle in direct proportion to



their normal loaded weight. According to the manufacturers the new differential provides full differential action between the driving axles of the truck.

In a six-wheel-drive truck with dual tires on the bogie axles the gross weight is normally arranged so that each of the ten tires on the truck carries its proportionate share of the load. Thus 1/5 or 20% of the gross load is carried on the two tires of the front axle while 4/5 or 80% of the gross load is carried on the eight tires of the rear bogie. The new FWD differential provides for a power division so that exactly 20% of the driving torque is delivered to the rear bogie.

Advantages claimed by the manufacturer include increased draw bar pull with free differential action, added hill climbing ability, elimination of front wheel spin, increased tire mileage, increased all around performance, lower operating and maintenance costs.

Requests for further information should be addressed to the Four Wheel Drive Auto Company, Clintonville, Wisconsin.

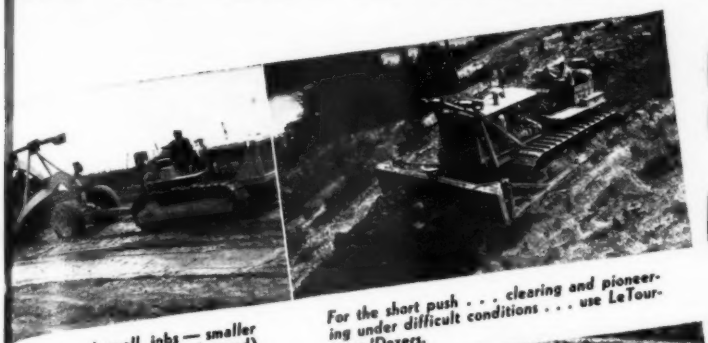
Filter Cartridge

American Optical Company, Southbridge, Massachusetts, announces another new filter cartridge for its versatile R-1000 respirator, thereby providing five interchangeable types of protection in one basic respirator.

The new filter gives comfortable protection against toxic dusts

OU'LL GET A LOWER NET COST PER YARD

STANDARDIZING on LeTOURNEAU



For the short push . . . clearing and pioneering under difficult conditions . . . use LeTourneau 'Dozers.

hort hauls and small jobs — smaller alls. Here an LS (11 yards heaped) chigan road job.

To make "scraper dirt" out of rocky material . . . to eliminate blasting costs and dangers . . . use a Rooter.

bigger yardages and longer hauls—big acity Carryalls. Here two double-bucket 's (30 heaped yards) on California levee job.

For shovel loading and truck hauling speeds . . . Tournatrailers, 10 to 30 yards capacity.

For compacting fills . . . LeTourneau Sheepsfoot Rollers in 2 and 4-drum sizes.

For lifting, carrying and spotting . . . LeTourneau Tractor Cranes.

For long hauls and faster earthmoving use Tournapulls. One of two C Tournapulls (11 yards heaped) on 6000-foot round trip haul in Arkansas.

COMPLETE LeTOURNEAU LINE . . . GIVES YOU RIGS TO HANDLE ALL TYPES OF EARTHMOVING JOBS AND CONDITIONS

Here's How You Save . . .

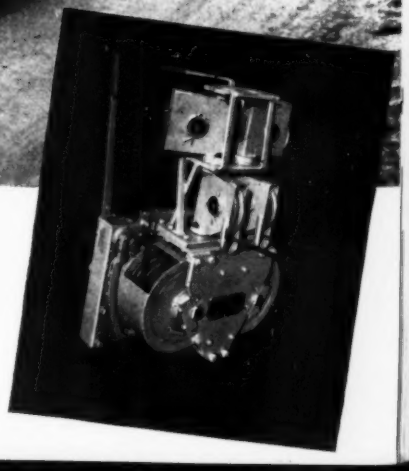
On Power—Your power source—a tractor—is never tied down to one piece of equipment. Equipped with a LeTourneau Power Control Unit, it will operate any LeTourneau rig—'Dozer, Carryall Scraper, Rooter, Tournatrailer, Crane. Change from one rig to another is easily and quickly made.

Breaking in Operators—Because a standard Power Control Unit controls all LeTourneau rigs, new men quickly get the hang of operating, can change from one rig to another without long break-in periods.

On Parts and Service—Many parts are interchangeable. Most repairs are easily made with a portable welder. Time losses are cut to a minimum because parts and service are available from any LeTourneau-"Caterpillar" dealer—more than 100 in the United States.

On Equipment Investment—Interchangeability reduces number of tractors required. Ability of Carryalls to load, haul, and spread eliminates need for special loading and spreading equipment. You save on initial investment, insurance, taxes and depreciation.

Check these savings. Ask your dealer to show you NOW . . . on your job . . . how LeTourneau equipment simplifies operating problems and puts extra profits in your pocket.



One method of Control for all units . . . the fast-acting LeTourneau Power Control Unit.

LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

For Lowest Net Cost per Yard—CARRYALL* SCRAPERS, ANGLEDOZERS*, CRANES, BULLDOZERS, POWER CONTROL UNITS, DRAG SCRAPERS, PUSHDOZERS, SHEEP'S FOOT ROLLERS, ROOTERS*, TREEDOZERS, TOURNAPULLS*, TOURNATRAILERS*. *Name Reg. U. S. Pat. Off.

formed by crushing, grinding or abrading such solids as lead, cadmium, arsenic, chromium, manganese, selenium, vanadium and their compounds.

The other four filter cartridges announced previously by the optical concern provide protection against: (1) pneumoconiosis-producing dusts like quartz, asbestos, ores, coal, flour, etc.; (2) low concentrations of fumes, vapors or gases encountered in paint spraying, and other light organic vapors; (3) low concentrations of acid fumes and gases; (4) low concentrations of combined acid-organic gases and vapors.

American Optical Company will furnish further information upon request.

Wheelbarrow Tire

A new tire for wheelbarrows and other industrial vehicles, called the Goodrich Silvertown Cushion-Type tire, has been placed on the market by The B. F. Goodrich Company, Akron, Ohio.

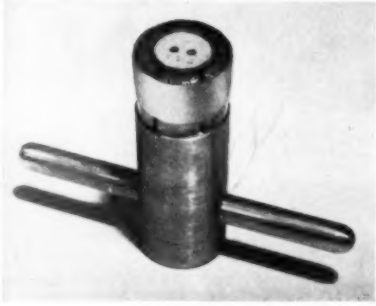
Like a pneumatic tire the new unit combines lightness, high cushioning qualities, streamlined appearance, and low cost—yet it has the sturdy construction and load-carrying capacity of a 4-ply pneumatic tire, according to the manufacturer. Because of its body of cushion rubber the new tire eliminates the hazard of tire failure from punctures or leaky valves, and requires no servicing such as inflation or repairs.

For wheelbarrows the tire is

available in the 16x4.00 and 16x-2.00 sizes with carrying capacities of 645 and 240 pounds respectively. The larger unit is designed to fit the lug base wheels of the same size single-tube pneumatic tire, while a special wheel has been designed for the 16x2.00 size.

Core Bits

Following completion of three years of experimental work on exploratory core drilling operations, Carboloy Company, Inc., subsidiary of General Electric Company, has announced commercial availability of its "Sinta-Set" core bits, designed to reduce



drilling costs, decrease drilling time, and eliminate the usual reconditioning and re-setting of diamond bits.

In the new Sinta-Set core bits, the entire matrix forming the crown of the bit is impregnated with industrial bort diamonds compared with the normal practice of hand or cast-setting of individual diamonds in the surface only of the crown. The bits can be operated on any type of rotary drilling equipment actuated by steam, air, gas or electricity with either mechanical or hydraulic feed.

Some outstanding advantages of the new bits, according to Carboloy, are that it will be unnecessary to reprocess bits when worn —no re-setting of diamonds, a simple two to five minute hand-blasting operation at the point of use will restore the bits to cutting condition when diamonds are worn, core bits may remain in the user's hands from time of purchase until worn out, users bit stock reduced, carrying diamond stocks for bits eliminated, diamond loss hazard while drilling lessened, lower cost diamonds (smaller size) can be used and the harder matrix will stand more abuse.

More information is obtainable from the Carboloy Company, Inc., 2973 E. Jefferson Avenue, Detroit, Michigan.

Power Control Unit

The Buckeye Traction Ditcher Company, Findlay, Ohio, announces that their medium duty G-L-T power control units are now available with adaptors to fit all makes and models of tractors. These hoists are built in single or double drum models, wide or standard drum. The single drum model will operate trailbuilders, bulldozers, single line scrapers, etc. The double drum model operates double line scrapers, etc., or a combination of bulldozer and single line equipment pulled by the tractor draw bar. It will operate equipment of approximately 15 yd. capacity and under. Gear ratios of 11.07 to 1.0 and 16.37 to 1.0 are available. Other ratios can be supplied on special request.

There is a double deck for the fairlead swivel sheaves to allow the best possible hookup for any equipment. Sheaves are placed on the upper deck for operation of bulldozing equipment. For operation of equipment attached to the tractor drawbar, sheaves are placed on the lower deck so as to put the line pull below the center of the power take off.

Emergency Jack

To meet the need for an emergency jack for use in heavy industries, Templeton, Kenly & Company, Chicago, Illinois, have introduced a model that has a full 20-ton lifting and holding capacity on either the cap or toe lift of the jack.

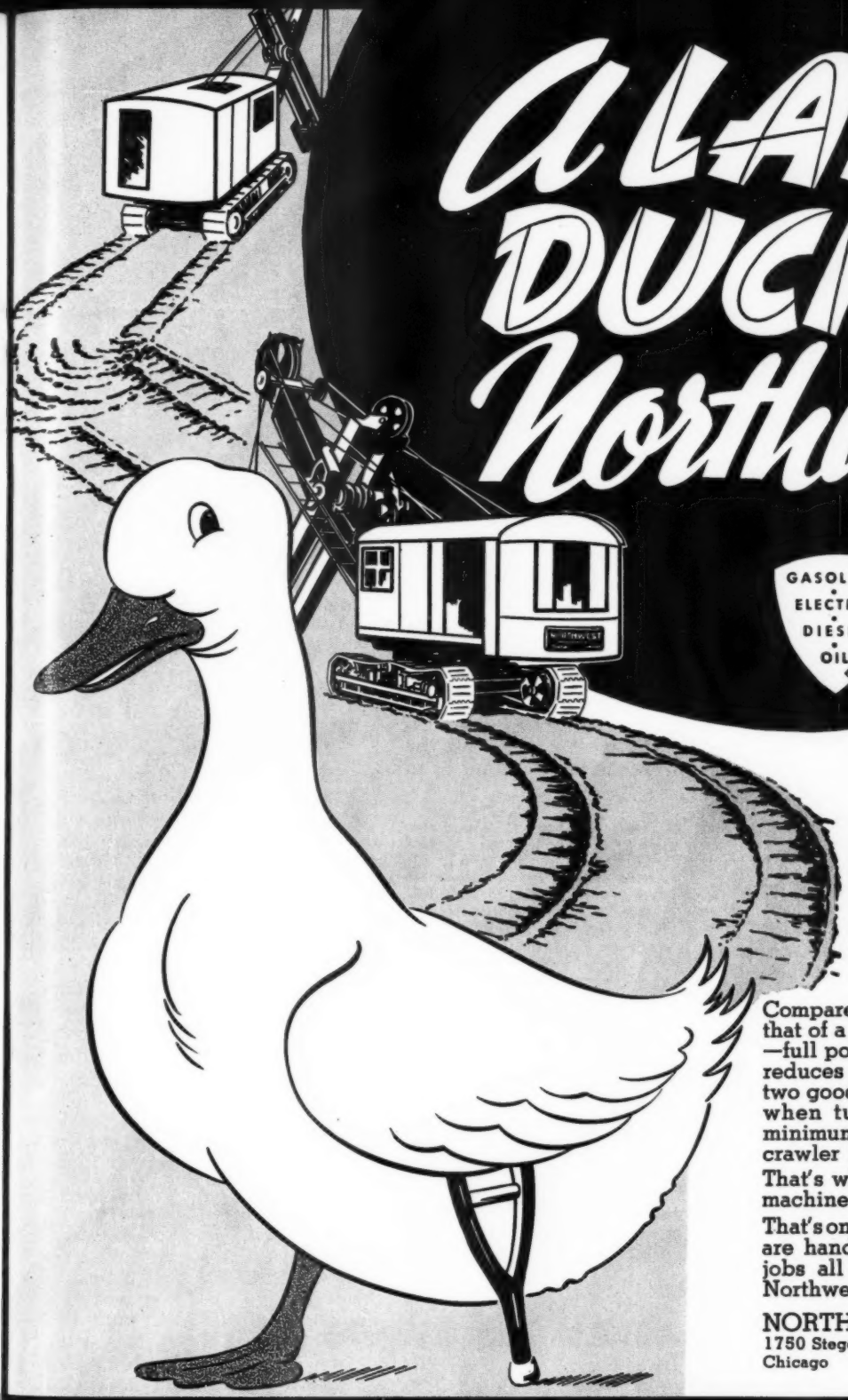
Designated No. 2030, this jack is 30″ high, has a full 17¾″ lift and weighs 167 pounds with complete equipment. Besides lifting on cap and toe, it lifts on the auxiliary shoe which hooks into the cap or on the chain with grab hook end, any link of which can be engaged with the recess in the cap.

Besides lifting and lowering vertically, this jack tilts on its base for jacking at any angle. The tilting pawl can be released by the operator's toe. The No. 2030 can be used horizontally for pushing, spreading or pulling by using the chain.

This jack is recommended by the manufacturer for mines, skidding rigs, mills and utility, construction and engineering projects where heavy machinery is used and where emergencies arise that demand the use of a heavy duty jack.

Your request for further information should be addressed to Templeton, Kenly & Co., Chicago, Illinois.

A LAME DUCK or a Northwest?



GASOLINE • ELECTRIC • DIESEL • OIL

Built in a range of 18 SIZES 3/8 yd. capacity and Larger

DOES your machine limp around the corners with only one live crawler—forcing the blocked crawler through the resisting surface crust of the earth—miring down in soft going—binding with destructive friction as it slides around—setting up strains that must eventually show themselves in repair bills and delays?

Compare this "Lame Duck" action with that of a Northwest—smooth easy travel—full power on both crawler belts that reduces the danger of miring down—two good feet pushing all the time, even when turning—strains reduced to a minimum—a long life, easily handled crawler base.

That's why Northwests go where other machines can't travel.

That's one of the reasons why Northwests are handling millions of yards on big jobs all over the country. Ask about Northwest Steering.

NORTHWEST ENGINEERING CO.
1750 Steger Building, 28 East Jackson Boulevard
Chicago Illinois

NORTHWEST

BUILT to help you Earn MORE MONEY!

A Decision Worth Remembering

A Texas tunnel contractor won a "wrestling match" by pinning the City of Dallas to the "mat" on four points of law, with the Texas Court of Civil Appeals acting as referee. Because a report of the match may help some other contractor flop an adversary on his back under similar circumstances, we give a summary of the bout.

Henry C. Beck contracted to construct a tunnel through a ridge, so that the city could divert the waters of a stream. He assigned the entire contract to Thomas H. Shortall, although the contract stated that it was not assignable without permission expressed in a resolution adopted by the city fathers. No such resolution having been adopted, the city thought that it had Tom on the hip when he sued for damages for being delayed in performing the job and for extra pay for uncontemplated expense incurred in doing the work.

But Tom flopped the city down on one haunch by showing that the city knew all the time that he was doing the work instead of Henry. The court decided (City of Dallas v. Shortall, 87 S. W. 2d, 844) that either there was an implied agreement between the city and Tom that he should be substituted as contractor, or the city, by its silence, waived any right to insist upon its assent to an assignment of the contract being expressed in a formal resolution.

Then Tom worked on the city to get the other haunch down on the mat. His demand for damages resulting from his crew being idle, etc., through delay of the city in procuring a right-of-way for the tunnel, was met by the city pointing to another clause in the contract. That clause said that the contractor should not be entitled to damages if delayed in *progress* of the work, but merely should be entitled additional time for performance. But the judicial "referee" pointed out that the delay complained of was not one arising in the *progress* of the work, but arose before the work was started. Said the court on this point:

"The contract necessarily assumed two fundamental facts, viz: (1) That the city had the right to construct the tunnel under the premises involved; and (2) the contractor had the ability to do the work. * * * * *"

The contractor "had the right to rely on the fact that" the city "had performed its fundamental duty of having secured the right of way before the work of construction would be directed to begin. It was necessary for "the contractor" to assemble the machinery and to employ the skilled labor necessary to this construction, when the work was directed to begin."

With the city's two haunches on the mat, it did not take Tom long to get both shoulders down, but to do that it had to show the "referee" that the city was liable for extras, because the contract contemplated that most of the excavation would be through solid rock, and required "gunite" construction, whereas it was discovered shortly after work was commenced that there was no solid rock formation that would sustain "gunite" construction.

Tom showed that this difference between conditions as they were supposed to be and as they actually were entailed more costly concrete construction, etc.

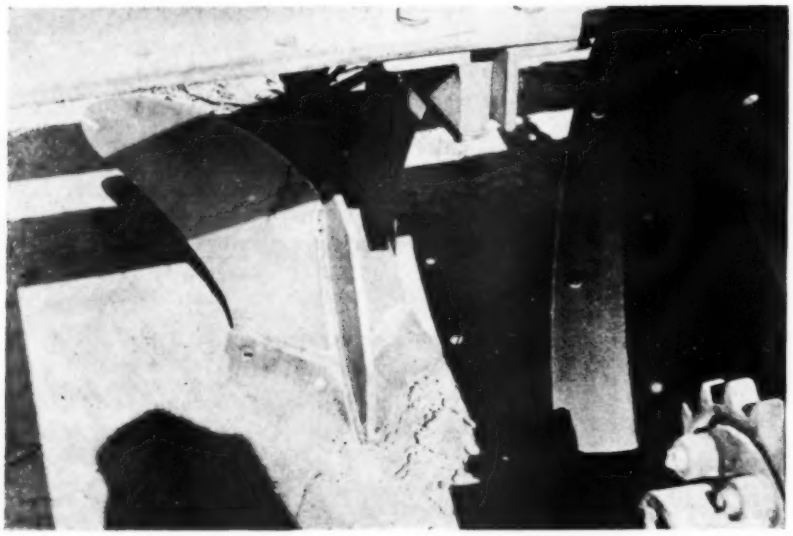
The Texas court adopted as sound the following statement found in a law book: "The general rule may be deduced from the decisions that where plans or specifications lead a public contractor reasonably to believe that conditions indicated therein exist, and may be relied upon in making his bid, he will be entitled to compensation for extra work or expense made necessary by conditions being other than as so represented."

This rule has been sustained by the highest court of the land and by the appellate courts of many states.

But to guard against any contractor being misled by this decision of the Texas court, we specially note that the contractor had been *directed to begin work* before he was delayed through tardy securing of the right of way. It is to be inferred that if the contract had not contemplated immediate commencement of the work, and if the city had not directed the contractor to begin, the delay in securing right of way might not have been actionable.

And, as to damages for extra expense incurred in encountering unexpected subterranean condi-

● **A four bottom farm lister, pulled by a Caterpillar tractor, was used to good advantage by Boyce & Igo in bond plowing for fills along the gravity main canal of the Gila Project, at Yuma, Arizona. The plow points were welded on and reinforced by welding on a cutting edge of ½ inch steel. This also served to break tree roots and hard ground ahead of the moldboard. Half moon sections of half-inch steel plate were also welded in the curves of the plow beams at the foot, to strengthen them for service with the tractor.**



WASHOUT WIPED UP IN LESS THAN 1 HOUR!

Quick Work on the Part of "Caterpillar" Diesel Tractor Speeds Traffic Through

Saves Delay on New Bridge Construction at Mouth of Horsethief Canyon

CAJON PASS, CALIF.—Destroyed by a heavy rain in the night, a section of Highway 66 was closed to traffic for a short time early this morning. All credit for accomplishing quick repairs goes to a bulldozer-equipped "Caterpillar" Diesel D6 Tractor owned by White & Wilburn, of Santa Monica.

Throwing its power and weight against the piles of heavy, wet sand and boulders left by the flood, the "Caterpillar" Diesel had the road passable again in less than an hour.

The stretch of highway damaged by the rain by-passes the new bridge being constructed at the mouth of Horsethief Canyon. The tractor's fast action not only relieved regular traffic but assured a steady flow of supplies so that the bridge-building would continue on schedule.

After repairing the washout, the tractor stood by to aid heavy vehicles across the soft fill.

The demonstration at Cajon Pass this morning makes it easy to understand why "Caterpillar" Diesel Tractors are noted for positive traction . . . rugged build . . . and determined, smashing power. Those desiring further information on these machines are directed to see their nearest "Caterpillar" dealer, or write to the Caterpillar Tractor Co., Peoria, Illinois.

• **Available in 5 sizes, from 25 to 110 drawbar horsepower, "Caterpillar" Diesel Tractors meet every need of today's construction work . . . make it possible for you to take advantage of their fuel-economy, dependability, and low maintenance-cost—regardless of whether your job is large or small. Grade-conquering, ground-beating traction and hard-hitting power make for fewer headaches on the job—and more profit when the job is over!**

CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL ENGINES AND ELECTRIC SETS

TRACK-TYPE TRACTORS • ROAD MACHINERY

● W. R. Shriver of California converted one of Barnum's cast-off circus wagons into this handy field service unit.

tions, it is to be remembered that unlike the circumstances of many other cases that have been before the courts, the circumstances of this case were such that the contractor had a right to rely upon the city's representation that solid rock existed, and was not bound to explore the site and assure himself as to just what conditions existed.—*Arthur L. H. Street, Attorney at Law.*

Circus Wagon Field Unit

The problem of fueling equipment is common enough to construction work, and so are the methods for the most part. An unusual and effective variation, however, was seen in the Coachella Desert of Southern California recently, where W. R. Shriver, subcontractor, uses one of Barnum's cast-off circus wagon trailers to make a circus out of the fueling part of his job.

Purchasing the wagon from one of the circuses wintering in that territory, Shriver outfitted it with new tires slightly oversize so that the wagon could be drawn more easily through the desert sand found in that part of the country. Diesel fuel, oil and grease can be stored and dispensed from the wagon, which can be drawn most anywhere to fuel equipment on a small job. Underneath the main wagon is a separate compartment where tools and spare parts needed on a construction job can easily be stored.

This unit is especially useful on a small project, where it can be locked up at night, dispensing with the services of a watchman who would ordinarily be hired for the purpose of guarding the fuel supply.—*Floyd Suter Bixby.*

Applying Artificial Respiration

This method has been used to save the lives of thousands of persons whose breathing has been stopped by—drowning, electric shock, inhalation of carbon monoxide gas, or injury.

What to Do

Lay the patient on his belly, one arm extended directly overhead, the other arm bent at elbow and with the face turned outward and resting on hand or forearm so that the nose and mouth are free for breathing.

Kneel straddling the patient's thighs with your knees placed at such a distance from the hip bones as will allow you to assume a comfortable pumping position. Place the palms of the hands on the small of the back with fingers resting on the ribs, the little finger just touching the lowest rib, with the thumb and fingers in a natural position, and the tips of the fingers just out of sight.

With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the patient. The shoulder should be directly over the heel of the hand at the end of the forward swing.

Do not bend your elbows. This operation should take about two seconds.

Now immediately swing backward to remove the pressure completely, thus returning to an upright position.

After two seconds, swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release, a complete respiration in four or five seconds.

Continue artificial respiration without interruption until natural breathing is restored, if necessary, four hours or longer, or until a physician declares the patient is dead, or until definite rigor mortis (stiffening of the body) sets in.

As soon as this artificial respiration has been started and while it is being continued, an assistant should loosen any tight clothing about the patient's neck, chest or waist. Keep the patient warm. Do not give any liquids whatever by mouth until the patient is fully conscious.

To avoid strain on the heart when the patient revives, he should be kept lying down and not allowed to stand or sit up. If the doctor has not arrived by the time the patient has revived, he should be given some stimulant, such as one teaspoonful of aromatic spirits of ammonia in a small glass of water or a hot drink of coffee or tea. The patient should be kept warm.

Resuscitation should be carried on at the nearest possible point to where the patient received his injuries. This means removing the patient from the dangerous position by breaking the contact with live electrical equipment (if a case of electric shock) or from the gaseous atmosphere (if asphyxiation). In breaking contacts with live electrical equipment protect yourself by shutting off power or in removing victim use a dry piece of wood or other non-conductor. He should not be moved from the point of resuscitation until he is breathing normally of his own volition and then moved only in a lying position.

A brief return of natural respiration is not a certain indication for stopping the resuscitation. Not infrequently the patient, after a temporary recovery of respiration, stops breathing again. The patient must be watched and if natural breathing stops, artificial respiration should be resumed at once.

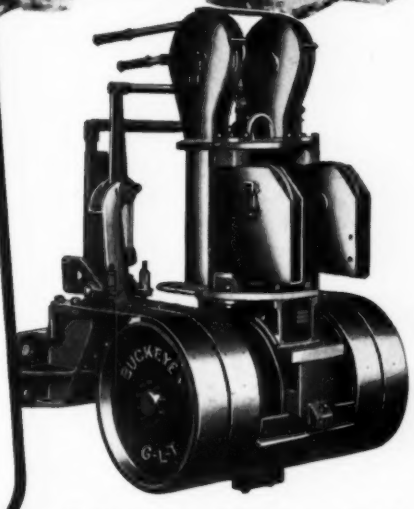
—*National Safety Council.*

Ride 'em Skinner!

HERE'S LIGHTNING AT YOUR FINGER TIPS

A TOUCH of the control and a battering ram of a blade leaps into action with all the "horses" in the engine unleashed in a mighty surge of power through the cable — split-second response — lightning-fast lift — dead stops in a fraction of an inch — all this power and drive with effortless, velvet smoothness!

Mister, if you've never ridden with a Buckeye G-L-T Power Control Unit behind you, you've got a thrill to come because you'll knock your own best bulldozing record right off the boards! Complete information is available to operators and owners. Write today!

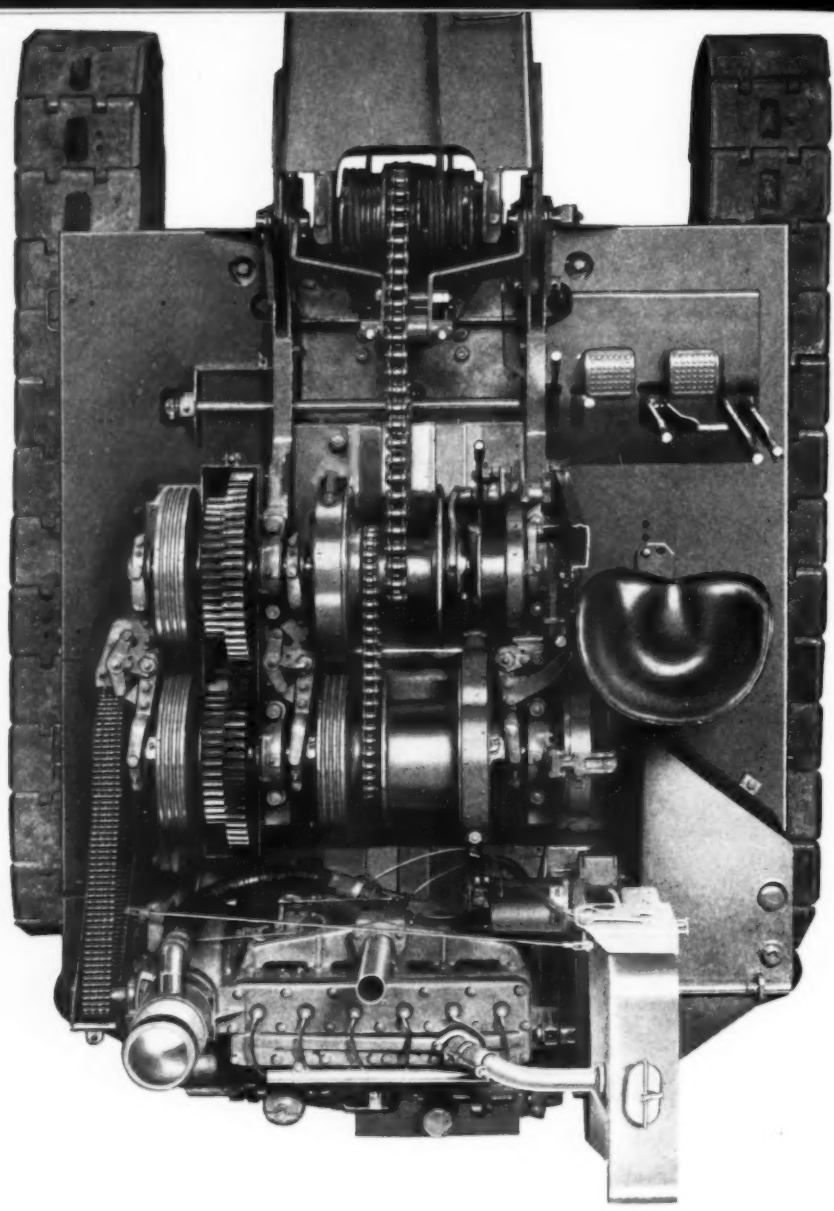


Buckeye Heavy Duty Power Control Unit. Also Medium Duty Hoists for ALL makes and models of Tractors.

BUCKEYE TRACTION DITCHER CO., Findlay, Ohio

BUILT BY Buckeye

For your convenience in writing to Buckeye Traction Ditcher Company, you will find a card bound in this issue.



The times

"Buy n

Construction of temporary military housing adds almost $45,000,000 to **engineering construction awards** for the week ended September 12, to bring the total to $120,809,000, the third highest volume of the year. The total is 76 per cent above the previous week, and 91 per cent higher than the volume for the corresponding 1939 week.

Public construction topped the preceding week by 162 per cent, and the 1939 week by 122 per cent. **Private awards** were 28 per cent higher than last year.

New construction financing for the first 38 weeks of 1940, $2,780,186,000, tops the $2,170,096,000 reported for the same period in 1939 by 28 per cent.

The **Chicago, Milwaukee, St. Paul & Pacific Railroad** is buying eighteen diesel electric switching locomotives at a cost of $1,300,000.

Unofficial estimates indicate that the gross business of the **Baldwin Locomotive Works** for August will be more than $16,000,000. This compares with $6,171,084 in July and with $5,972,204 in August last year.

Net sales of the **Pittsburgh Metallurgical Co.** for the fiscal year ended June 30 were $1,867,660, or almost double the $982,206 for the previous fiscal year.

For the third time in a year **Reliance Electric & Engineering Company,** Cleveland, is expanding its plant adding 12,000 square feet of floor area.

Timken Roller Bearing made a net profit of $4,996,546 in the six months ended June 30, as against $3,422,370 in the first half of 1939.

American Zinc Co. will spend $500,000 to recondition and enlarge a large electrolytic plant at Monsanto, Ill., and production will be under way early in 1941.

Because of increasing residential and commercial demands, the **Bell System** added 65,400 telephone stations to its lines during August—the largest gain recorded for any August since 1936. For 1940 up to date the Bell System has added 536,700 telephones as compared with 433,400, the first eight months of 1939.

On account of increased movement of automobiles, coal and miscellaneous manufactured products, the **Pere Marquette Railway** this year expects to have gross revenues of more than $32,500,000, the largest since 1930. . . . On Sept. 18 the road launched a new $2,000,000 car ferry to transport passengers, freight, freight cars and highway vehicles across Lake Michigan from Manitowoc, Wis., to Ludington, Mich.

During August **passenger traffic on domestic air lines** was 61 per cent above August, 1939. A new peak for the month.

The **electric light and power industry** of the United States during the week ended Aug. 31 produced 2,601,127,000 kwh of electricity, an increase of 10.3 per cent over the like 1939 week.

For the week ended Sept. 2 **steel ingot production,** as compiled by **Dow, Jones & Co., Inc.,** was 91½ per cent of capacity, a gain of 1 per cent over the previous week.

Lockheed Aircraft Corporation earned $508,860 in the first six months of 1939. In the similar period this year its earnings jumped to $2,022,619.

essay:

ow and buy the best"

Alfred Kauffman, president of the **Link-Belt Company,** has completed a survey which convinces him that about 135,000 automatic bin-fed stokers will be sold this year as against 104,289 in 1939.

New construction has reached the highest volume since 1930. **The National City Bank of New York** says this is largely due to record activity in small home building as well as to industrial contracts. Whether small home building is being rushed in fear of rising costs remains to be seen.

University of Texas business statisticians have discovered that wages for Texas workers in July were 5.4 per cent above July, 1939.

Hoover Company's sales of vacuum cleaners so far this year have been the second best in its history.

More than 15,000 men will be employed in the big aircraft factory which the **Curtiss-Wright Corporation** will build near the northerly lines of Buffalo Airport. Construction will get under way by Oct. 1.

Loadings of bituminous coal into vessels at lower lake ports in the week ended Sept. 2 amounted to 1,442,728 tons, an increase of 3.1 per cent over the like week in 1939.

Sears, Roebuck & Co. in August sold 21.9 per cent more goods than in August, 1939. **Montgomery Ward** shows a gain of 9.5 per cent. General Robert E. Wood, chairman of Sears, says he expects that the 1940 sales of the Sears retail stores will exceed $450,000,000 with profits of more than $30,000,000.

The **Pennsylvania Railroad** plans to spend $500,000 on improving its Buffalo Division to increase the efficiency of handling greater freight traffic. This will mean many new jobs for Buffalo area workers.

And now comes the third monthly upswing in the **accumulated backlog of unfilled orders in the durable goods industries.** The Department of Commerce announces an increase of 13 per cent during July, the largest increase in a single month reported this year. It must be remembered in this connection that the department's figures do not include the aircraft industry where backlogs are at an all-time peak.

Central Greyhound Lines, Inc., has bought some ground in Buffalo at a cost of $185,000 and on it will build a bus terminal to cost $145,000.

During the next two years the **Continental Can Company** will spend $15,000,000 in expanding and improving its manufacturing, development and research facilities. **Carle C. Conway,** chairman, says that the expenditures "will be allocated to various parts of the country wherever it is determined that they will produce the greatest results through improved service and products." Since 1930 the company has expended approximately $50,000,000 for these purposes.

The news items reprinted here are only the beginning! Billions of defense funds shot into the arm of expanding industry mean rush jobs aplenty ahead for you. It's a good time to invest in new equipment — deliveries may be hard to get later on. Soon you'll be up to your ears in rush jobs that can't wait — you'll need the tough, top quality machines that stand up to fast performance on continuous two and three shift operation. Modern high speed equipment is a good hedge against inflation, puts taxable profits into future earning power, saves expensive and troublesome maintenance, qualifies you for the big profit jobs and gets them done faster so you can take more of them. The best you can buy is none too good for the busy times to come. Buy now and buy the best!

Bucyrus·Erie
SOUTH MILWAUKEE, WISCONSIN, U. S. A.

Shots from the FIRING LINE

Hansen Dam is Completed

By Floyd Suter Bixby

On August 18th, fully a year ahead of schedule, 2000 residents of the San Fernando Valley, California, stood high over Tujunga Wash and heard the age old story of Man's conquest over the ravages of Nature extolled by visiting notables.

In sharp contrast to the gray and white earth and concrete ramparts of Hansen Dam, the assemblage stood quietly on the service bridge which crosses the spillway of the massive structure and heard Lieut. Col. Edwin C. Kelton of the Army Engineers tell how at last "Tujunga Wash can no longer be called the father of Los Angeles County floods."

The huge dam, largest rolled earth fill dam of its type in the world today, was pushed to completion a year ahead of schedule by the Guy F. Atkinson Company of San Francisco, builders of the mighty bulwark, who were awarded the government contract for construction in August, 1938. (For complete article on Hansen Dam see Excavating Engineer, July, 1939.)

Rising 122 feet above the stream bed of Tujunga Wash, the crest of the big dam extends two miles from the west end of the Verdugo Mountains to the low foothills of the San Gabriels. Over 1,500,000 cubic yards of concrete and more than 11,000,000 pounds of steel reinforcement were involved among other quantities in the structure. The cost to the government was approximately $5,000,000.

Acting as master of ceremonies, Chairman Roger Jessup of the Los Angeles County Board of Supervisors, recalled the disastrous flood of March, 1938, which wrought 4½ million dollars worth of property damage and cost 30 lives. He traced the flood control activity over a period of twoscore years, praising the day when it was realized in Washington that the periodic southland floods presented a problem nationalistic in scope.

● **Upstream face of California's Hansen Dam showing spillway and outlet works. The dam was dedicated in August, 1940, one year ahead of schedule.**

Dr. Homer Hansen, whose home for 21 years stood on the rock knoll which was selected for the spillway site, also spoke briefly. His home was condemned and demolished to make way for the work.

"I am humbly proud that this structure bears the name of my family," the physician said.

This winter, when Father Tujunga comes roaring down from the mountains, he will find barring his path a massive bulwark of earth and concrete with a flood control basin of 790 acres at spillway height and 1160 acres at the top of the structure, with a maximum capacity of 53,800 acre feet. The drainage area tributary to the flood control basin covers an area of 147.4 miles.

● **Testing an International truck on the "twist course" of the International Harvester Company's new proving ground at Fort Wayne.**

Federal-aid Highway Program to Stress Defense Needs

By Bethune Jones

Nearly all of next year's $275,000,000 federal-aid highway construction work will be carried out under direction of the Army and Navy, according to announcement September 6 in Washington by Federal Works Administrator John M. Carmody, who said that in the interest of national defense he would concentrate the 1941-42 program on roads and bridges certified by the War and Navy Departments to be of strategic importance. The program, he said, would place emphasis on reinforcing routes for operation of heavy new mechanized and motorized military units.

Expected to take almost all the $137,500,000 federal-aid appropriated by Congress plus an equal amount from the states, or a total of $275,000,000, the Army and Navy road program resulted from a survey of defense highway needs conducted by the Public Roads Administration and state highway directors at the request of President Roosevelt. Operations would begin, Carmody announced, following President Roosevelt's signing of the new Federal-aid Act and approval of the survey.

In accordance with the President's request, Carmody said, "particular attention will be paid to the strength of bridges, the width of strategic roads, adequacy of ingress and egress at urban centers and the servicing of existing and proposed Army, Navy and Marine Corps posts and air bases.

"If our highway system is to function

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KOEHRING HEAVY DUTY

"Loads of power for loading" means a heaping payload every trip with the Koehring Wheeler. Application of power is both behind and ahead of the cutting blade. Pusher tractor behind the cutting blade, synchronized with the pulling power of the Koehring Tractor, quickly forces the material well back in the Wheeler body for full loads. The Koehring Wheeler Method of moving dirt utilizes available power and speed to the fullest advantage — power for loading — speed for traveling. Dirt moving costs are lower when the Koehring Wheeler Method is used.

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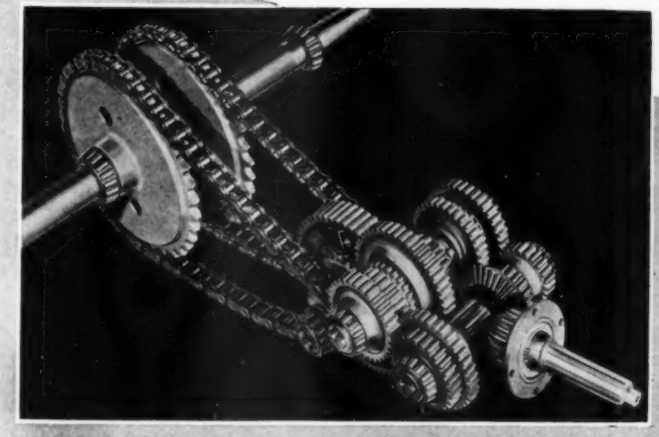


Constant mesh transmission, housed in oil-tight case — spiderless type differential — without stub shafts or planetary gears — flexible chain drive — are important operating features of the Koehring Wheeler Tractor. Gears are compactly assembled yet easily accessible for inspection. Koehring Tractor maintenance costs are especially low.

HEAVY-DUTY CONSTRUCTION EQUIPMENT

For your convenience in writing to Koehring Co., you will find a card bound in this issue.

● Air view of Rhode Island's new Jamestown bridge, spanning the west passage of Narragansett Bay, which was dedicated last month. The bridge supplants a ferry which had been operating since 1675.

as smoothly as that of Germany, more than 2,000 structurally-weak bridges must be strengthened, old roads straightened and widened, grades reduced, grade crossings eliminated and obsolete structures replaced."

A large part of this supplemental work would be done by WPA workers, Carmody said.

Carmody further announced that the program probably would not call for major new construction. He said officials believed that the present 80,000 miles of hard-surfaced highways would meet strategic requirements if properly reinforced. However, he added, there appeared to be a need for some 6,000 miles of "access" or "approach" roads.

The new program, Carmody pointed out, would mark the first time since President Wilson, in 1916, joined the hands of Federal and State governments in defraying equally the cost of national highway construction that the armed services of the nation have assumed virtual direction of its road program.

New Gold Dredge for Idaho

The Fisher-Baumhoff gold digger near Centerville lost its rank as Idaho's largest dredge last month when the Snake River Mining Co.'s new boat started operating on the Yankee Fork of the Salmon river near Sunbeam.

Built extra heavy and powerful because the ground is hard to dig and contains a good many boulders, the new dredge has a total operating weight of 1,100 tons and a normal operating capacity of 195,000 yards per month.

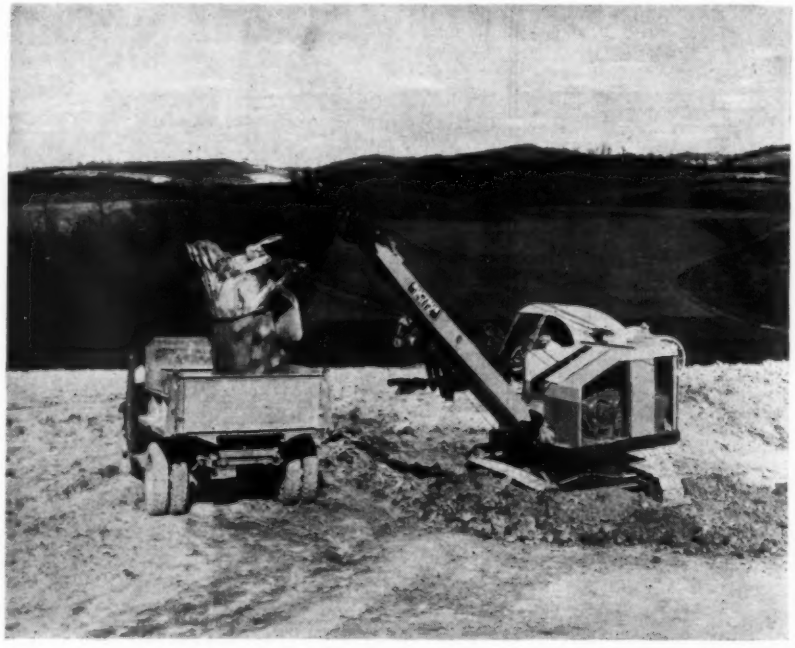
Financing the enterprise is a subsidiary of the Silas Mason contracting firm of New York, which participated in construction of Grand Coulee and Bonneville dams. Arnold Hanger of Richmond, Ky., is president and Sam A. Mason II of Charles City, Va., is treasurer.

The Bucyrus-Erie Co. of South Milwaukee, Wis., and the Olson Mfg. Co., of Boise cooperated in constructing the dredge and both had experts at the site to supervise the assembly job. R. P. Tileston of Boise is representing the Boise firm at the site and C. D. Schlemmer is the mining company's field superintendent.

Gold reclaiming equipment will be floated by 25 pontoons of 10 tons each, all constructed at the Olson plant east of Boise. They are 27 feet long, 10 feet wide and 10½ feet deep. Bolted together they make a boat 114 feet long by 54 feet wide. The Boise firm furnished another 250 tons of structural material and superstructure, while the digging machinery and gold saving devices were designed and furnished by the Bucyrus-Erie firm which has been building dredges since 1895.

The bucket line dredge is designed to dig to a depth of 30 feet. It has 72 buckets of 8 cubic feet each. Two diesel electric engines of 400 h.p. each will furnish the power. Storage space for 15,000 gallons of fuel oil is provided in two of the pontoons built in Boise. The dredge is equipped with heating plant for winter operations and a repair shop.

Ground on the Yankee Fork was tested last summer and yardage is available for several years of operation. The operators plan to work four shifts of six hours each.



● Using a ⅜-yard shovel, C. M. Hall of Delmont, Pennsylvania, uncovers a limestone deposit on a hill top of a farm near Claridge, Pennsylvania.

Pennsylvania Strengthens Rural Road System

Pennsylvania will launch a rural road building program this fall involving several million dollars, according to announcement September 5 in Harrisburg by Governor Arthur H. James.

The work will be in addition to approximately $40,000,000 of major state construction projects now in progress or under contract, he stated, and will not affect the 1941 highway construction schedule now being drafted for a total of $23,000,000.

To consist largely of reconstruction and resurfacing of macadam and light asphalt roads, the rural road program will be done mostly by engineering and construction forces of the State Highway Department, although some may be let out on private contract, Governor James said.

Explaining that money for the rural road program is available "largely because the WPA hasn't absorbed all the money that was allotted to it," Governor James declared: "We allotted $11,000,000 to WPA. It looks very much like they will hardly absorb more than

What does Reliable Power mean to YOU?

When a contractor's power plant fails . . . and there is no rock coming from the crusher, or no material from a hot mix plant, the overhead of idle men takes all the profit out of a job.

Contractors need power that will take care of the job from start to finish—power that is instantly available and can be depended upon without any pampering. They want a power plant that is compact and readily transportable to the next location.

Atlas Diesels, such as the one pictured below, were proven in the construction industry more than ten years ago. They have earned enviable records all over the world for their stamina and dependability. Your choice of power may spell the difference between profit and loss on any job. Buy an Atlas Diesel and take no chances. Complete information sent on request . . . without obligation to you.

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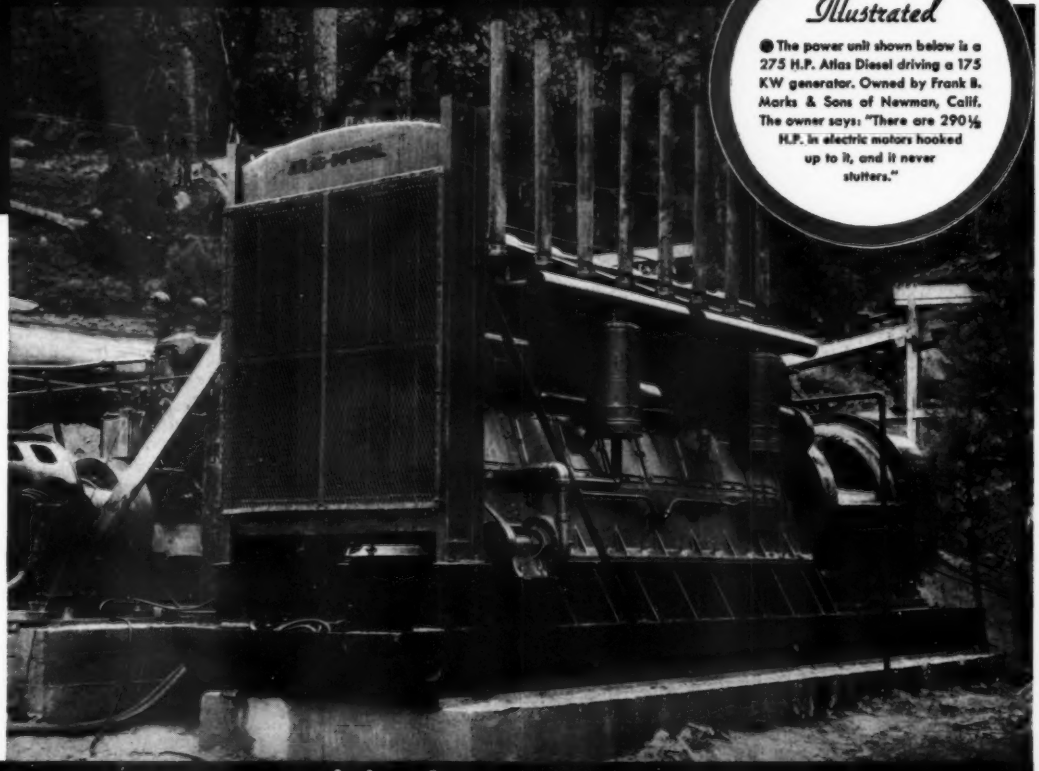
SOUTHWESTERN DIVISION 1775 NAVIGATION BOULEVARD, HOUSTON, TEXAS
WESTERN DIVISION 1000 NINETEENTH AVENUE, OAKLAND, CALIFORNIA

Illustrated

● The power unit shown below is a 275 H.P. Atlas Diesel driving a 175 KW generator. Owned by Frank B. Marks & Sons of Newman, Calif. The owner says: "There are 290½ H.P. in electric motors hooked up to it, and it never stutters."



ATLAS *Imperial* DIESEL ENGINES

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$8,000,000. We think there will be several million dollars we can make available for this work."

WPA Defense Projects Total $500,000,000

Rapid expansion of preparedness activities during the last few months has served to boost the five-year total of WPA expenditures for national defense purposes close to the half billion dollar mark, according to Howard O. Hunter, Deputy Work Projects Commissioner.

The WPA program of the coming months, Mr. Hunter said, will emphasize the improvement of roads of strategic military importance. This work will be done to a great extent in cooperation with, and on the recommendation of, the Public Roads Administration and the War and Navy Departments.

Included in this work will be the construction and improvement of "access" roads to military and naval reservations and airports and of roads on such reservations. Another and new type of highway work will be the widening of shoulders, especially on major routes, to permit the parking of army convoys engaged in maneuvers without obstructing usual traffic.

It is also proposed that WPA improve routes paralleling main highways to permit the simultaneous movement of several columns of troops and supplies. Projects for the widening and the strengthening of bridges and the elimination of other obstructions on roads of military importance will be stressed everywhere, according to present plans.

Recapitulating WPA and sponsors' expenditures on projects directly related to defense purposes from the beginning of the WPA program through June 30, 1940 shows that a total of $421,011,000 has been spent on facilities for the Army, Navy and Coast Guard, on publicly-owned airports and on armories, rifle ranges, camps, etc., for National Guard.

Since July 1 of the current year, with the new emphasis which has been placed on preparedness, WPA has authorized further expenditures totaling $34,392,000 for national defense projects.

In addition, hundreds of millions of WPA funds have gone since 1935 into projects which, while not directly related to national defense, have an important bearing on the nation's military preparedness. Examples of this are expenditures of more than $325,000,000 for construction and improvements of primary highways, including bridges; of approximately $160,700,000 on projects related to public health, and of $325,993,000 in the conservation of soil and natural resources.

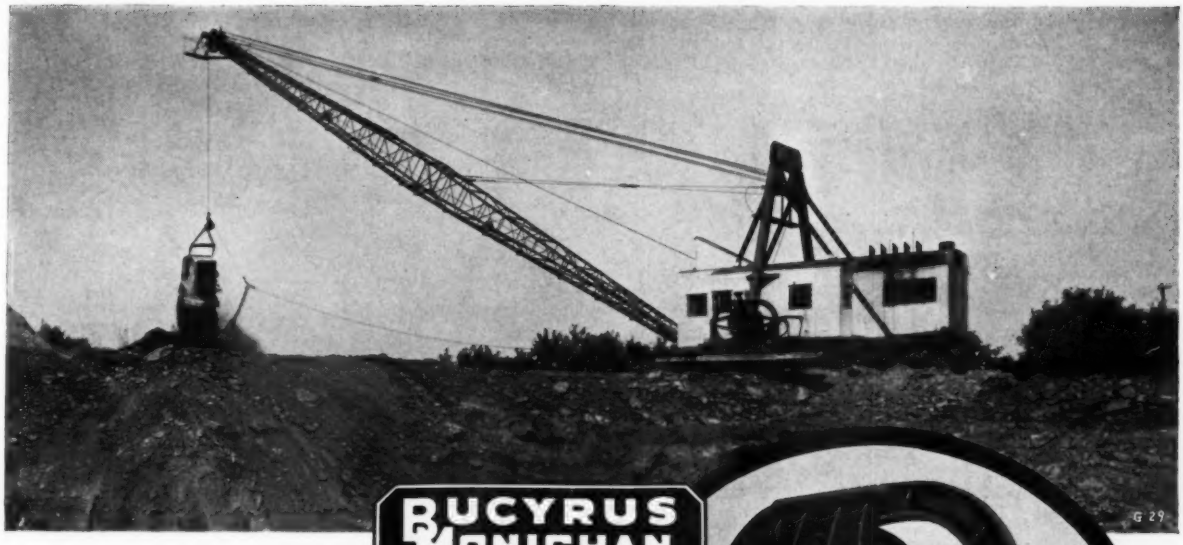
● **This sixteenth century excavation scene shows workmen digging a moat and hoisting the dirt on an endless bucket chain for fill between the castle walls. The Latin inscription on this old engraving reads: "A new machine which wherever soil is needed, with very few workmen and at low cost removes it from a depression and brings it up to the proper point to fill in the sides of a wall."**

Vernon Brothers Awarded Idaho Reclamation Contract

Award of a contract for the construction of two wasteways on the lateral system of the Black Canyon Canal which will serve the new Payette Division of the Boise federal reclamation project in Idaho has been made to the Vernon Brothers Company of Boise, Idaho. Their bid of $84,572.50 was the lowest of twelve proposals received and opened by the Bureau of Reclamation at its Boise, Idaho office.

The contract covers earthwork and structures for the Graveyard Gulch and the Langley Gulch wasteways. It involves the excavation of 356,000 cubic yards of materials, the construction of concrete drops and chutes, canal, highway and railroad crossings, bridges, drains, inlets and other miscellaneous structures.

Black Canyon Canal, with an initial capacity of 1,909 second-feet, heads at the Black Canyon Dam and runs west for a distance of about 30 miles. Its route follows the southern edge of the Payette Valley, first through the



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The exclusive Bucyrus-Monighan Rolling Cam gives a walking action that is smooth and positive; that "cushions down" the machine at the end of each step with an ease that means long life. The construction of the Rolling Cam is such that Bucyrus-Monighan walking maintains its efficiency even after long hard service, without need for constant adjustments. Here's the reason: The walking action is governed by the free-working cam rolling in its track, guided by deep double flanges on the cam. The few moving parts are designed with liberal clearance between cam and track—effectiveness is not impaired with long use. This has been proven repeatedly in the field by Bucyrus-Monighans which step out as positively, as surely and as gently after million-yard service as they did when they were new.

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orchards on the Emmett Slope and then along a steep hill near Plymouth, where it crosses the Payette-Boise summit. There the canal divides into two branches, the "A" Line and "D" Line canals, which continue westward along the Boise and Payette Slopes. The Graveyard Gulch wasteway extends north from the Black Canyon Canal just before it branches and crosses the Payette Valley Branch of the Union Pacific Railroad. The Langley Gulch wasteway extends north from the "A" Line Canal to a point near New Plymouth.

Work on the main canal is completed and construction of the lateral system is under way. This new Payette Division will add 47,000 acres to one of the oldest and largest Federal reclamation projects.

Vermont Plans 10-Year Highway Program

Requirements for highways and bridges totaling nearly $29,000,000 are embodied in a 10-year Vermont state highway program, drawn up on the basis of findings from a statewide highway planning survey, it was announced in Montpelier recently by the state highway board.

A preliminary report on the present condition of Vermont highways, needs for the next 10 years, and a study of road life, were discussed by the board September 4 at a four-hour conference with John T. Lynch, highway engineer economist for the public roads administration, and H. R. Farrington, director of the planning survey.

Board members said the entire report would be revamped, condensed and placed in form for presentation to the State Legislature. The material itself is the result of several years of field and office work by employees of the planning and traffic survey.

The proposed program would mean an average annual expenditure of about $2,800,000. The department is currently spending more than that amount, it was stated by Chairman William F. Corry.

● An Allis-Chalmers powered Garwood scraper travels at top speed from cut to fill on a road job in western Iowa between Onowa and Turin. Hudkins-Perry held the contract.

Rush Sand Point, Washington Airport

Additional men have been assigned by WPA authorities to rush construction of the landing field at the United States Naval Air Station, Sand Point, just north of Seattle, Washington.

Carl W. Smith, state Work Projects Administrator, announced that this project would complete the grading of the 450 acre field by November 11, and called for a WPA expenditure of $102,000 to be matched by the 13th Naval District as sponsor, with $128,400. Three shifts of crews are working 7 days a week.

A previous project for grading the big airfield was completed by WPA July 2, requiring $24,000 in addition to $80,000 from the Navy.

Construction of the hard surface runways will be done by private contractors after WPA completes the huge grading operations. The main runway, extending northwest and southeast will be

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Unequalled for handling earth, clay, sand, gravel, loose rock, stone, etc., at ranges from 100 to 1500 ft., a SAUERMAN Power Drag Scraper or Cableway Excavator will move a given yardage in shorter time and at lower cost than any other machine.
Only SAUERMAN Machines will dig, haul, and dump in one economical straight-line operation. Adaptable to any job and flexible to meet various digging conditions, SAUERMAN Machines are versatile beyond all others, are the fastest machines, and the most economical for handling material at long ranges.
This 4 cu. yd. SAUERMAN Scraper operated from a movable tower, digging and loading, into cars 1550 cu. yd. in 8 hours. Thus a sewage tank basin 1250' x 360' x 30' was dug in record time.
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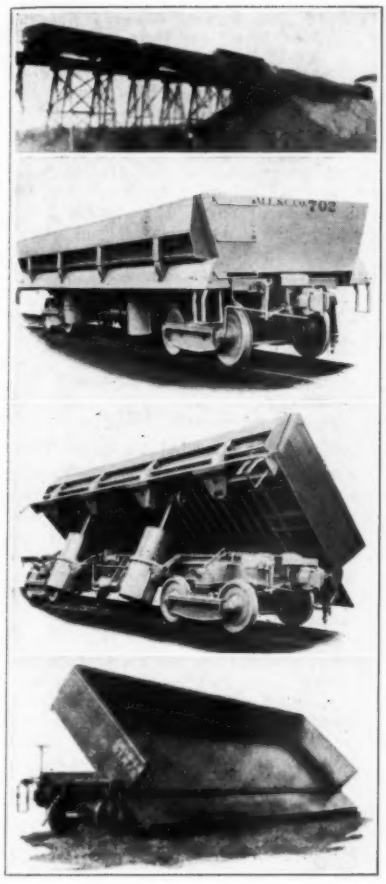

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AIR DUMP CARS

30-Yd. Capacity with AXLESS Trucks

Lead the field in strength with reduced weight.

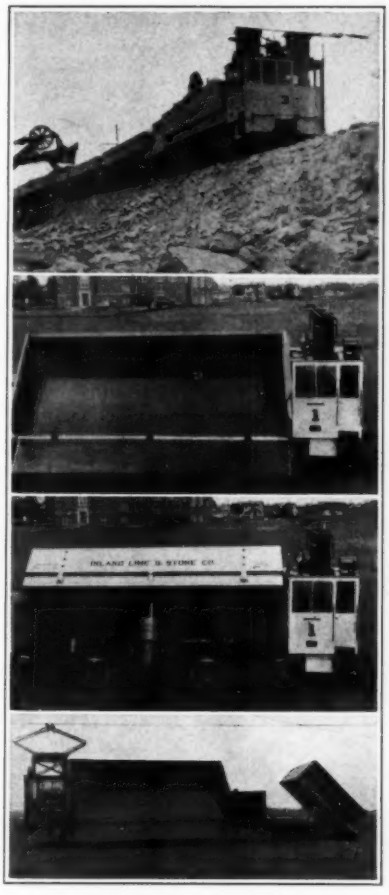
Reduced train resistance and increased pay load per locomotive.

Sticks to the track at higher speeds.

Less Maintenance.

Lower overall cost per ton material hauled.

Other sizes from 50 cu. ft. to 50 cu. yds.



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ELECTRIC LOCOMOTIVES

30-yd. Capacity
1200 Horse Power

Haul heavy trains up steep grades.

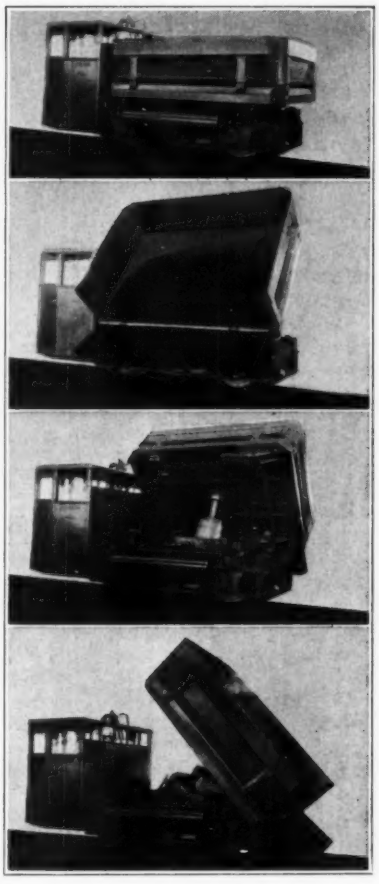
Large pay loads.

Less dead weight.

Low cost transportation.

Pay load ballast increases adhesion for quick acceleration and safety.

Differential burden bearing locomotives reduce haulage costs 20 to 30% due to the pay load on the locomotive.



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Dumps Right, Left and End

180 cu. ft., 12-ton Capacity

15 cu. yd., 25-ton Capacity

Air dump for quick discharge. Makes an 18 ft. width berm at top of rail when side dumping.

When end dumping it will form a 10 ft. width berm and plow the ore level with top of rails.

No trestle required — builds its own dump; or greatly increases capacity under permanent trestle.

3 way and 2 way dump bodies for rubber tired trucks and trailers.

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AIR DUMP CARS — MINE CARS — ELECTRIC LOCOMOTIVES
8 WHEELED MINE LOCOMOTIVES — STOCKPILE CARS — ELECTRIC TRAINS
COMPLETE HAULAGE SYSTEMS

DIFFERENTIAL STEEL CAR CO., FINDLAY, OHIO

For your convenience in writing to Differential Steel Car Co., you will find a card bound in this issue.

● Geo. Brewster & Sons of Bogota, New Jersey use their Bucyrus-Erie 29-W in sinking 130-foot caissons to support the new 14th Street Viaduct in Hoboken, New Jersey. (R. A. Wurgel Photo.)

3,700 feet long. Three secondary runways will each be 2,600 feet long and a "cross wind" runway will be 2,000 feet long.

There are five power shovels, three 90 horse-power caterpillar tractors, two tandem 16 yard scrapers, a single 16 yard scraper and 25 trucks in use on the project. Rentals for this equipment were financed by the Navy contribution.

Final completion of the project calls for removal of an additional 400,000 cubic yards of earth. Excavation from the high points is removed to a fill to straighten the shore line of Lake Washington at the air station. Work on this air field was started in 1937.

Delaware Aqueduct Contractors Must Meet Water Shortage

Although surrounded by New York City's vast reservoirs, many homes and estates in Northern Westchester County today faced a water shortage. Engineers attributed the drying up of artesian wells and century-old cisterns to blasts fired far underground by sandhogs digging New York's $290,000,000 Delaware aqueduct.

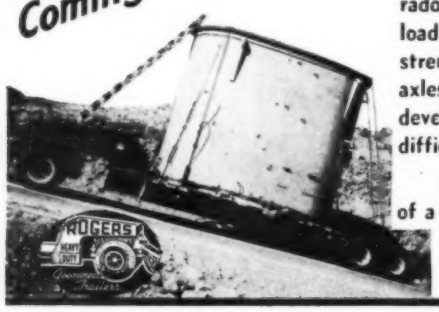
In blasting the aqueduct through rock 500 feet beneath the earth's surface, the workmen have left cracks in the bottoms of wells and cisterns overhead, engineers of the New York Board of Water Supply explained. The stored water then leaked into the unfinished aqueduct or seeped into other subterranean cavities, they said.

Complaints from more than 100 householders have been received by the water board and all have been referred to the aqueduct contractors, whose agreements with New York require them to assume full responsbility for property damage.

Lacking municipal water services, several residential areas in the towns of North Castle, Bedford and Somers relied solely on wells and cisterns. When those sources became arid, the contractors were urged by town authorties to provide relief. The contractors decided that permanent remedies could not be undertaken until the aqueduct was completed in 1942 with a watertight concrete lining.

Meanwhile, they arranged temporary relief. Storage tanks have been deliv-

Coming UP the Mountain *with a* TREMENDOUS LOAD



The Rogers Trailer which hauled this 75 ton transformer up a steep Colorado mountain for the Metropolitan Water District was designed for minimum loading height and road clearance; fabricated from steel of high tensile strength and completely electrically welded; mounted on double-oscillating axles to distribute the load over 20 tires and equipped with a highly developed braking system to afford complete safety of control under difficult conditions rarely encountered.

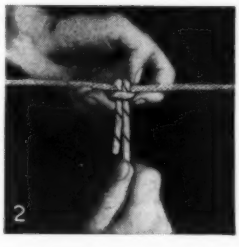
Before buying your trailer learn why the Rogers is the first choice of a majority of moving and erecting engineers. 136 Orchard St.

ROGERS BROS. CORP. Albion, Penna.

EXPERIENCE *built it* · PERFORMANCE *sold it*

For your convenience in writing to Rogers Brothers Corporation, you will find a card bound in this issue.

THE SQUARE KNOT IS *right* FOR MAIN LINE CONNECTIONS



For the main surface lines connecting holes and rows of holes, use Plain Primacord. It is light in weight, flexible, waterproof, and sufficiently resistant to abrasion—ideal for this service.

The continuous main line can be made up of separate lengths, each connection being a *square* knot, as shown. This type of connection should be used above ground only—*never in a bore hole.* In fact, it is advisable to see that the Primacord used in a bore hole is one continuous length, without joints of any kind.

Primacord-Bickford Detonating Fuse, used correctly, increases blasting efficiency and decreases cost and hazard. Write for bulletins.

PRIMACORD·BICKFORD *Detonating* FUSE

THE ENSIGN-BICKFORD CO., Simsbury, Conn.

Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836

PB25

1. Tie through cartridge.
2. Half hitch branch to main line.
3. Connect main line lengths with *square* knot.
4. Fuse and cap on end of main line.

IMPORTANT: Branch lines should lead away from main lines at *right angles.* Avoid kinks and small loops.

For your convenience in writing to The Ensign-Bickford Company, you will find a card bound in this issue.

ered to most of the affected homes and will be filled daily from tank trucks, contractors said. In the case of one estate, near Armonk, a pipeline was extended three-quarters of a mile to provide water directly from Kensico reservoir.

1939 Aggregate Output

Total output of crushed and broken stone in the United States in 1939, as reported to the Bureau of Mines, United States Department of the Interior, by producers, amounted to 145,148,770 short tons valued at $132,908,489, an increase of 18 per cent in quantity and 13 per cent in value compared with 1938. Included in this total is stone sold or used for concrete aggregates, railroad ballast, riprap, agricultural limestone, refractory stone, stone for metallurgical use (flux), limestone sand, alkali works, calcium carbide works, sugar and glass factories, paper mills, and various other chemical and manufacturing processes. Stone used in the manufacture of lime or cement, asphaltic stone, and slate used for granules or flour are not included in this total.

Crushed or broken stone used for concrete aggregates and railroad ballast constituted 72 per cent of the industry in 1939—103,891,020 short tons valued at $93,958,275. Nearly 46 per cent of the concrete and road making aggregates was produced by noncommercial operators (states, counties, municipalities, and other government agencies). Noncommercial production in 1939 increased 29 per cent compared with 1938, whereas commercial output declined 1 per cent.

● **Brrr! This familiar scene will soon be repeated in many sections of the country. Here, a Caterpillar motor-grader pushes a V-type snow plow for Poweshiek County, Iowa.**

In 1939 64 per cent of the commercial aggregates was transported by truck; 22 per cent by railroad; 9 per cent by water; and the remainder unspecified. Comparable figures for 1938 are as follows: Truck, 60 per cent; rail, 22 per cent; waterway, 10 per cent.

Crushed stone for metallurgical purposes, which ranks next to concrete aggregates in quantity consumed, increased 78 per cent in quantity and 82 per cent in value. Limestone for agricultural use (5,459,260 short tons valued at $6,592,827) increased in both quantity and value. Of the total, 487,500 short

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

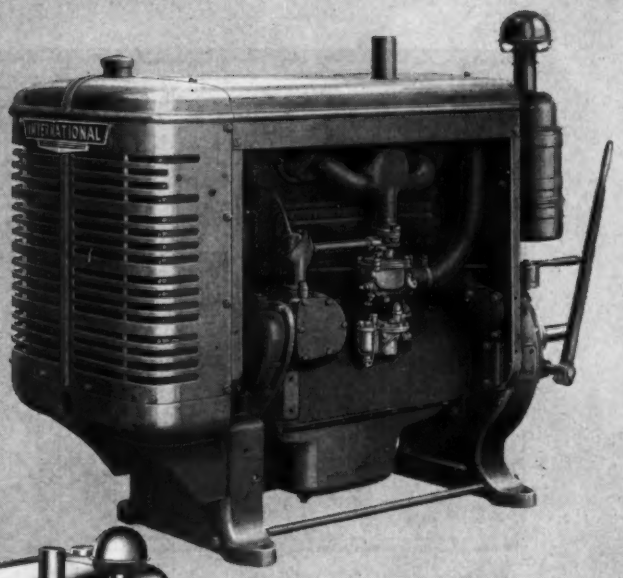
New International
POWER UNITS

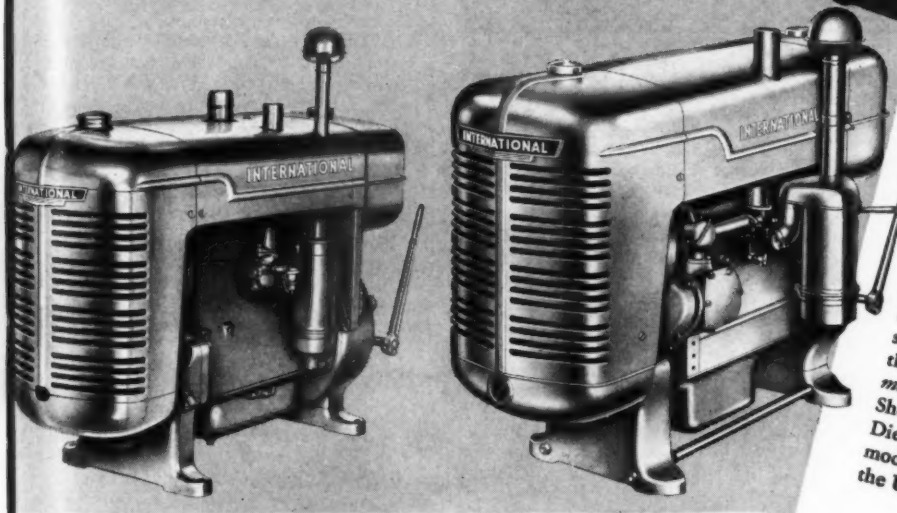
RIGHT: **U-6—41 h. p. at 1,500 r. p. m.**

CENTER: **U-4—31½ h. p. at 1,800 r. p. m.**

BELOW, LEFT: **U-2—22 h. p. at 1,800 r. p. m.**

Operating on Gasoline





Also—Four New International DIESELS

• In addition to the new carburetor-type engines, the International line also includes Four New Diesel Power Units. They provide smooth, low-cost Diesel Power in compact, convenient form—easy to install, simple to operate, and quick and easy to start. They are engineered all the way through for *economy of operation and maintenance*, and *long heavy-duty service*. Shown below is the big 6-cylinder UD-18 Diesel—100 h.p. at 1,400 r.p.m. Other models are the small UD-6, and the UD-9 and UD-14.

THESE NEW INTERNATIONAL POWER UNITS are 4-cylinder engines, readily adapted to a wide variety of jobs. They bring *new efficiency* and *new economy* in their power range. Their *quality construction* pays out on the job in terms of low operating and maintenance cost, long life, and stamina to stand up under 24-hour-a-day operation.

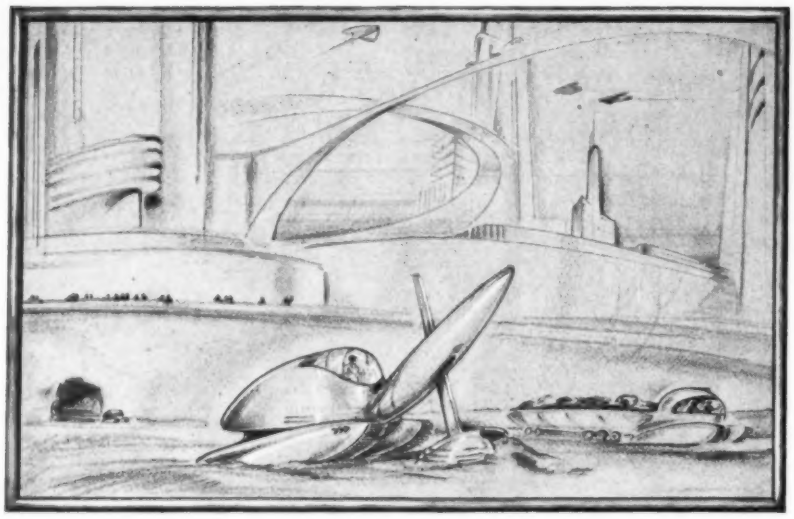
Among the many features that prove of great value for all kinds of work are: Valve-in-head design, replaceable cylinders, full-floating piston pins, efficient combustion control, pressure lubrication, Tocco-hardened crankshafts, precision-type main bearings, and efficient cooling. Basic parts can be attached or removed without interfering with other parts, making possible many equipment combinations to meet individual needs.

The nearby International dealer or branch will give you complete information on the New U-2, U-4, and U-6, and other International Power Units ranging up to 110 max. h.p. All carburetor-type engines in the line operate on gasoline, gas, distillate, and kerosene.

INTERNATIONAL HARVESTER COMPANY

180 NO. MICHIGAN AVE. CHICAGO, ILLINOIS

INTERNATIONAL Industrial Power



● Keeping pace with the present "world of tomorrow" trend we present the "shovel of tomorrow" moving dirt against a futuristic background. (Sketch courtesy of Barnes & Reinecke.)

tons valued at $513,508 was noncommercial production by the Soil Conservation Service, W.P.A., and other governmental agencies. Refractory stone (ganister, mica schist, dolomite, and soapstone) amounting to 1,492,310 short tons valued at $2,044,054, more than doubled the 1938 production (659,690 short tons valued at $991,765).

Limestone used for miscellaneous purposes increased along all lines with the exception of fertilizer filler and filter beds, which registered small declines. Limestone sand, which is comparatively new, showed an increase of 18 per cent in quantity in 1939 over the 1938 production.

Dredge Lower Ohio River

Every effort is being made by United States engineers of the Louisville district to complete all channel dredging in the lower Ohio river during the present low water period. A fleet of Government dredges is at work at strategic points to improve navigation conditions before the winter season. The suction dredge Jewett is at work on the Tell City bar, where a cut was completed along the Indiana shore and work now is under way on the Kentucky side of the bar. At Sisters Islands, below Rosiclare, Ill., the dredge Harris is excavating a deeper and wider channel.

At the upper approach to Lock and Dam No. 53, above Mound City, Ill., the suction dredge Taber, the dipper dredge Adams and a derrick boat are removing accumulated silt. The dredge Nolin River is dredging the lower approach to Dam No. 45, Stephensport, Ky.

The Badgett Construction Company is constructing 11,590 feet of revetment on the bank of the Ohio river near Henderson, Ky., which will prevent erosion of the banks, caused by swells of passing boats.

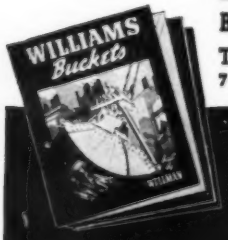
Rural Road Mileage

According to recent figures on road mileage, there are now 2,936,228 miles on the rural system. This total is administered as follows: federal and state, 425,858 miles; county, 1,683,910

JOBS DON'T COME TOUGHER THAN THIS ONE!

▶ This Williams ½ Yard Multiple Rope Bucket took plenty of punishment on this job—tearing out the massive stone and concrete foundations of the old Baldwin Locomotive Works in Philadelphia.

The digging power in Williams design and the rugged durability of their welded rolled steel construction make Williams Buckets profit producers for contractors everywhere.



Bulletins describing all types of Williams Buckets sent **FREE** on request.

THE WELLMAN ENGINEERING CO.
7002 CENTRAL AVE., CLEVELAND, OHIO

WILLIAMS *Buckets*
built by WELLMAN

For your convenience in writing to The Wellman Engineering Co., you will find a card bound in this issue.

miles, and township, 826,460 miles. The federal and state systems are 37 per cent paved with high-type surfacing, the county system is 2 per cent paved and the township system is also 2 per cent paved. Unimproved mileage on the federal and state systems amounts to 10 per cent, on the county system 44 per cent and on the township system 48 per cent.

Medium-type to low-type improvement exists on 53 per cent of the federal and state systems, 54 per cent of the county system and 50 per cent of the township system. Seven per cent of the entire rural system is paved with high-type surfacing, 7 per cent with medium-type, 24 per cent with low-type and 19 per cent with improved earth. Forty-three per cent is unimproved.

Montana Postpones Bituminous Conference

Because the Montana Highway Department has under way this season one of the largest and most extensive construction programs which they have had for a number of years and due to the fact that the full time of all their engineering staff is required in handling this construction program, state officials have decided that the Sixth Annual Montana National Bituminous Conference would be postponed until the fall of 1941.

Earth Vibrations Due to Quarry Blasting

Valuable information on the causes and effects of earth vibrations due to the firing of blasts in quarries has been obtained as the result of a study made by the Bureau of Mines, Department of the Interior. The problem is of considerable importance in numerous communities where damage to buildings has occurred, allegedly due to such blasts.

In order to ascertain the possible effect of certain variable factors present in all quarry tests, experiments were made by the Bureau of Mines in an underground limestone mine in which conditions could be controlled with more precision.

These mine tests were designed so that many of the variable factors present in quarry blasting could be eliminated entirely or their effects closely evaluated. Tests and results were as follows:

Holes drilled to break gave less vibration than those drilled blind with too great a burden to break. This indicated that for comparison all shots must be made in holes that do not break.

In all tests it was impossible to distinguish between tamped and untamped holes as measured by the vibrational effect.

Change of shape of explosive charge had no effect on the seismic wave.

Shots made in isolated pillars gave frequencies, amplitudes, and speed of propagation similar to those made in a rib continuous to the recording station. There was evidenced, however, a decided difference in the shape of the waves recorded. In fact, as this matter of wave shape was studied more intensively, it was found that the position of a shot in the mine could be identified from the recorded wave shape.

When multiple shots were made from the same place but were delayed by intervals of 2 to 5 thousandths of a second, there was no evidence of synchronism and magnified amplitudes. In all cases of such delayed shots the maximum amplitude recorded was never greater than the maximum from a single shot of the same explosive charge.

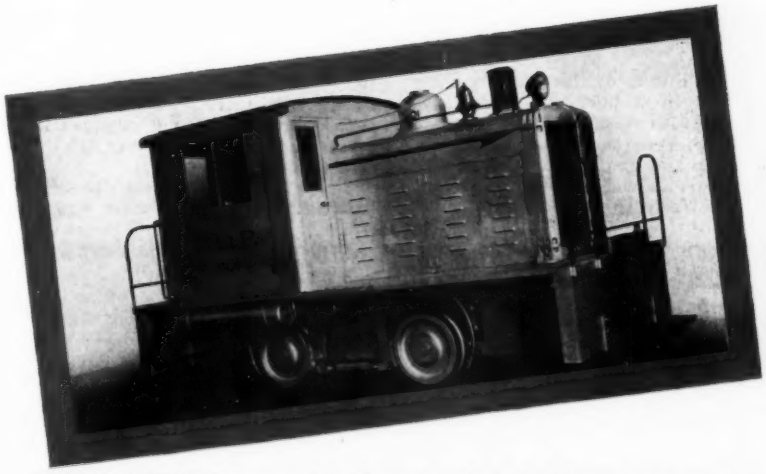
Comparisons were made with ten explosives of different physical characteristics. No definite conclusions could be drawn from these tests, although they indicated that explosives with a high detonating speed tended to give greater vibrational effects.

Tests made between explosives of different percentage strengths resulted in no definite conclusions, although there was some evidence that the stronger explosives gave more vibrational effect.

Under controlled conditions in the mine, it was definitely determined that amplitude did decrease with increase in distance from the shot.

Amplitude increases with weight of

Better Performance
at Lower Cost



ENGINEERS interested in keeping their hauling costs at a minimum want Whitcomb Locomotives on the job. They know that the rugged construction — all welded frame and steel cab — insures long and dependable service. The combination of power with rapid acceleration enables hauling heavy loads on short schedules. The Whitcomb cross equalizer — the enemy of maintenance costs — affords three-point suspension causing the spring rigging and running gear to absorb track irregularities rather than the upper portion of the locomotive.

Operators endorse their judgment when they climb into the comfortable cab. All gauges and controls are conveniently located for easy operation. Every model is designed for maximum visibility.

WRITE FOR FULL PARTICULARS. NO OBLIGATION.

BLW THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

For your convenience in writing to The Whitcomb Locomotive Company, you will find a card bound in this issue.

explosive charge but not in direct ratio. The increase is comparatively rapid with the smaller-sized shot but is less between larger shots.

Any mathematical formula to express the relation between amplitude, distance, and weight of explosive charge is as yet impossible of computation. Constants must be determined to fit different kinds of rock, stratigraphic conditions, and possibly the physical characteristics of the explosives themselves.

Some results of this study are summarized in Report of Investigations 3407, "Earth vibrations caused by mine blasting: Progress Report 2," by J. R. Thoenen and Stephen L. Windes, which may be obtained from the Bureau of Mines, Washington, D. C.

● **Left: Glenn Johnson, youthful manager of a fleet of hauling trucks, prepares for a ski jaunt. Right: Johnson's bachelor quarters on the shore of the gravel pit lake which he excavated and stocked with trout and pan fish.**

Bachelor Contractor Tames Fish

By Ormal I. Sprungman

Oddest of pastimes is the one claimed by youthful Glenn Johnson of Minneapolis, who manages a fleet of hauling trucks when he is not engaged in his spare time hobby of taming fish to feed from his hand.

Johnson first began befriending piscatorial pets several years ago when he built himself a bachelor's quarters on the shore of a small pond originally used for gravel-washing. He decided to enlarge the spring-fed pond by blasting and excavating to provide a handy spot for swimming and skating, Johnson's favorite sports. His finished lake measured 450 feet across and nearly 80 feet deep—plenty deep for fishing, if he only had the fish!

With income derived from the sand he removed, he ordered 5,000 fingerling trout from a Wisconsin hatchery. On the following year he added 60 trout averaging a pound apiece, and these piscatorial giants have increased in size to over three pounds. Sunfish and crappies were also added, and many of these are now within keeper size.

Johnson accidentally started fish-taming when he found that the smaller fish would come up within range whenever he threw angleworms on the surface of the lake. It wasn't long before the fish would swim up unafraid to take food from his hand, darting in and out between his legs while he himself was in swimming.

Ohio's Testing Laboratory

It's all grist that reaches the testing laboratory of the Ohio department of highways.

From thread to premolded asphalt bridge plank, and from manila rope to paving brick, the highway department laboratory workers painstakingly test everything that goes into road construction, bridge building, road maintenance, office equipment and new buildings.

More than a hundred assorted items were put through the laboratory testing devices last year, in the highway department's search for those materials which measure up to specifications, which will stand wear and tear, and which are used to make better and safer roads for the 2,000,000 Ohio automobile owners.

The laboratory is an interesting place, too. Watching the men there "rattle" a brick until it comes out of the machine with its corners rounded off, is a new experience for many persons, and standing by as the workers put soil through their devices to determine its ingredients and its stability, is educational, to say the least.

Paper, carbon paper, light bulbs, automobile heaters and sirens, hammers and hatchets, handles for tools, coal, water for use in concrete, gasoline, oils and greases, wiping rags, typewriter ribbons, safety glass for automobile glazing, lanterns and torches, solvents, cleaning compounds, paints and varnishes, gravel, limestone and slag, concrete pipe, steel and cast iron pipe, steel reinforcement, woven wire fence, rivets and castings, tire chains and wire rope, road oil, waterproofing compounds, bolts, welds and pitch are a few of the scores of articles which went through the testing laboratory last year, as the highway department carried on its quest for quality materials to be used in every operation, from office to highway construction.

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proves it
Any clamshell that will dig under water as the Haiss Hi-Power does 's got what it takes. You can make money with one on ANY job. Write or wire for prices. All sizes.
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SAFETY *first* . . . ECONOMY *always*

with

BUCYRUS ERIE

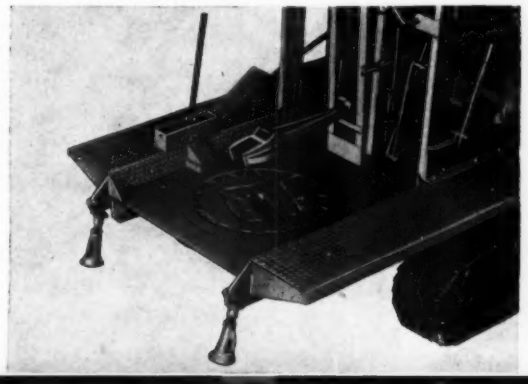
MODERN BLAST HOLE DRILLS

Operators "take to" the new large platform and built-in tool wrench found on modern Bucyrus-Erie blast hole drills. And well they should, for every thought for safety as well as efficiency was considered when Bucyrus-Erie engineers, with 73 years of successful drill designing to their credit, planned this new feature.

They built a large platform, big enough to allow ample room for a couple of pairs of husky shoes to keep out of the way of the bone-crushing weight of heavy tools. Pressed non-skid steel was used for the floor to give *better footing* than any pair of hob nailed boots—And the men work up off the wet ground and out of the muck.

Not only does this important improvement in blast hole drills make drilling safer, but it also makes it faster. The mechanical built-in tool wrench breaks tool joints quickly and eliminates all the back breaking labor and delay involved in handling heavy tool wrenches. This new turning wrench, driven by a bevel-gear drive beneath the operator's platform, is operated by means of an easily worked hand-lever ratchet on the operator's platform (by power on the 42-T). A holding wrench is hinged within the derrick-foot so it can be quickly and easily swung down for use. A common nail serves as a shear pin—when this snaps the joint is tight enough; thus, accurate setting of tool joints is assured.

Built-in tool wrenches are now available on the complete line of Bucyrus-Erie blast hole drilling equipment —the 27-T, 29-T, and 42-T. See for yourself how you can speed up your work, keep sharper tools on your rigs, and help satisfied operators to get the maximum output from modern Bucyrus-Erie drills. Investigate your drilling costs NOW. You'll find modern Bucyrus-Erie drills can save you money.



Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

NOT in the *Contract*

A Scottish farmer had agreed to deliver twenty hens to the local poulterer. When the birds arrived there were only nineteen in the case.

Just before the shop closed for the night, the farmer came hurryng in, bringing the twentieth hen.

"Man, but you're late with this one."

"Ay, but she din'a lay until this afternoon."

Lady: "Have you tried to cure this parrot of cursing?"

Pet Shop Proprietor: "Hell, yes, lady, but the damn-fool bird only gets worse all the time!"

And what did mamma's little baby learn in school today?

I learned two kids bigger'n I never to call me mamma's little baby again.

Girl Customer: "Does this lipstick come off easily?"

Cosmetics Clerk: "Not if you put up a fight!"

The handsome deck steward approached the young lady leaning over the rail.

"Waiting for the moon to come up?" he asked.

"Ye gods!" cried the seasick maiden, in a wail of despair, "does that have to come up, too?"

First Motorist: "I love the beauties of the countryside."

Second Motorist: "So do I. Sometimes I even give 'em a lift."

Bachelor: A man who can have a girl on his knees without having her on his hands.

If women's clothes did not change so often, there would be more change in men's.

"Come, come, Mendolson, quit trying to show off and take that up th' right way!"

Smart Chickens

Three managers of chicken farms in Germany, so the story goes, were being questioned by an investigator.

"What do you feed your chickens?" he asked the first.

"Corn."

"You're under arrest! We use corn to feed the people."

The second overheard this conversation, and tried to play safe.

"What do you feed your chickens?" came the question.

"Corn husks."

"You're under arrest! We use husks to make cloth. And you?" he asked, turning to the third man.

"I give the chickens the money and tell them to go buy their own food."

Joe: "Why does Geraldine let all the boys kiss her?"

Tom: "She once slapped a lad who was chewing tobacco."

Weekly newspapers have their difficult problems. The editor of an Illinois weekly wished he ran a daily when he had to give his readers complete news about Grandma Smith. However, after much thought, he packed the story into this sentence.

"Grandma Smith is very low as we go to press. If she dies, she will be buried Sunday."

Shovelrunner Ike: "We certainly had a big time last night for ten cents."

His Gal: "I'll say! I wonder how little brother spent it?"

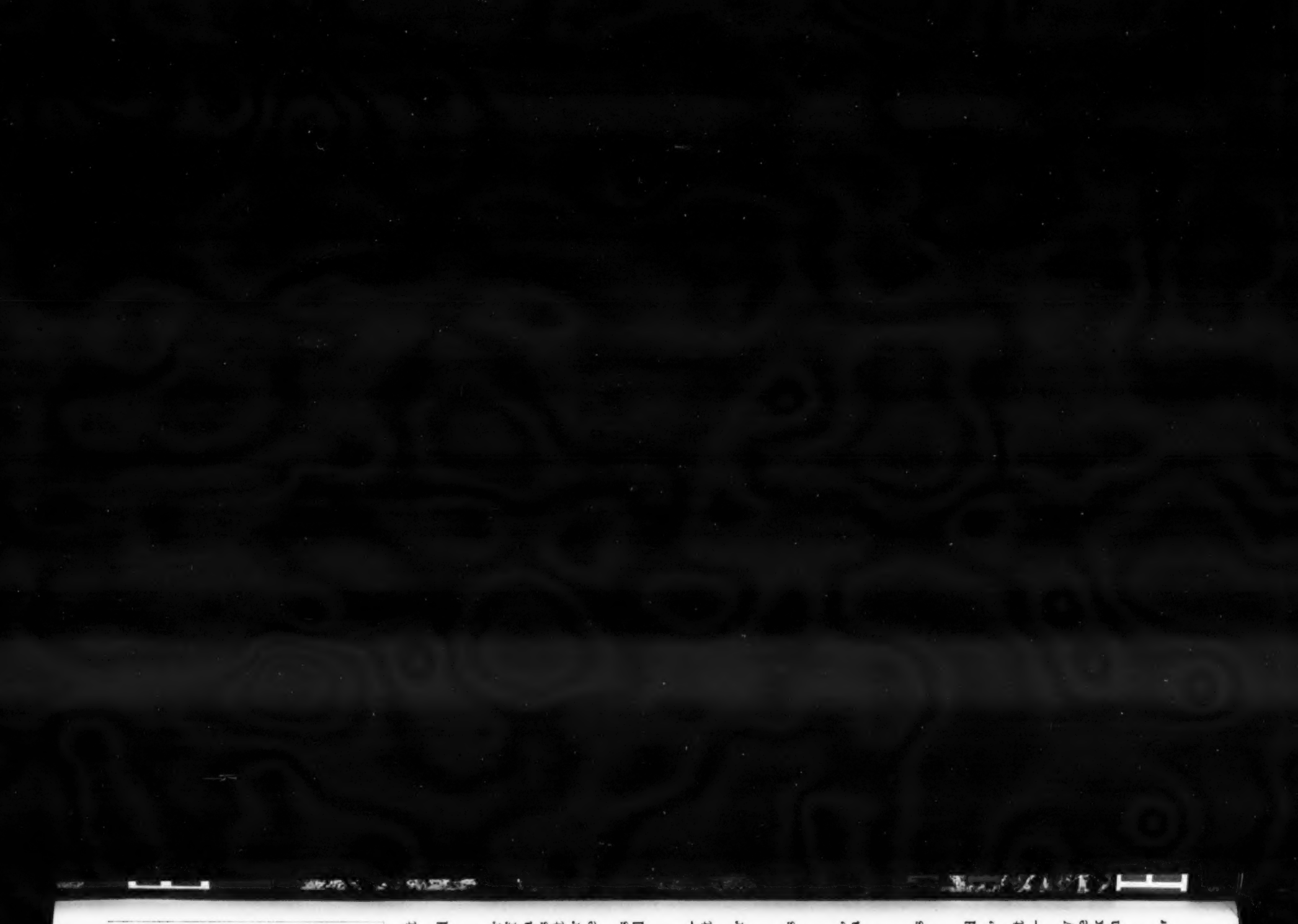
A girl with curves always has trouble getting a square deal.

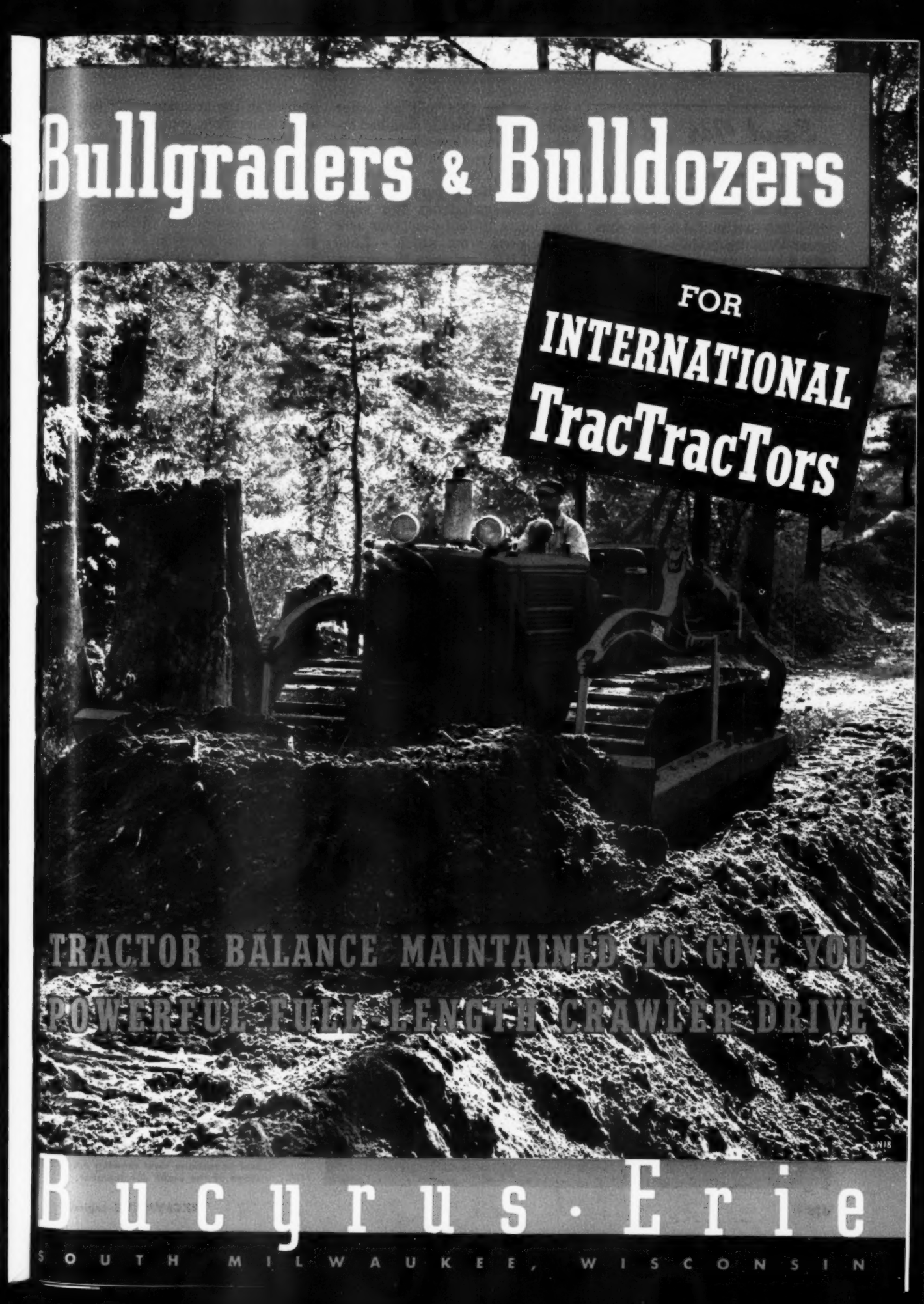
A sheep which resided at Sutton,
For emergencies cared not a button.
At an oncoming car
It merely said "Bah"—
And in less than two toots it was mutton.

Sam found a job on a railroad gang and was leaving his family, when his wife shouted back:

"Come heah, Sam. You haven't cut a stick of wood for de stove—and you'll be gone a week."

The negro turned, looked very much aggrieved: "Honey," he said, "what's de mattah? You talk as if ah was takin' de axe with me."




Bullgraders & Bulldozers
FOR
INTERNATIONAL
TracTracTors
TRACTOR BALANCE MAINTAINED TO GIVE YOU
POWERFUL FULL LENGTH CRAWLER DRIVE
N18
Bucyrus·Erie
SOUTH MILWAUKEE, WISCONSIN

Sand For Sale

(Continued from page 573)

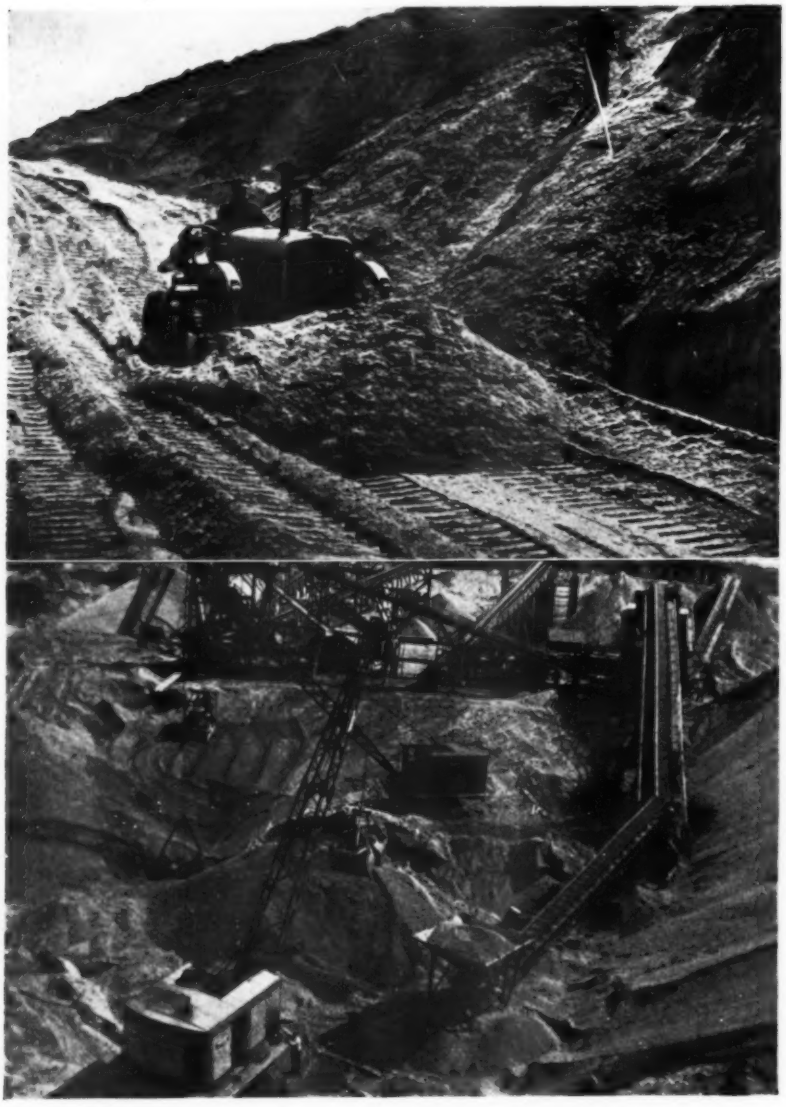
hopper is done with the 37-B and the 34-B Bucyrus-Erie cranes.

The 250-foot movable field conveyor, with its 30-inch belt and Jeffrey idlers, discharges onto the lower end of a 160-foot inclined fixed feed conveyor which also has a 30-inch belt and Jeffrey idlers.

With the discharge of material from the upper end of this 160-foot fixed feed conveyor into a wash box, the process of washing and sizing the product begins. A powerful jet of water in the wash box subjects the excavated material to its first cleaning.

Water for this and all other washing operations is obtained originally from Cow Bay and is pumped up from the bay with an 1,800 gpm, 25 HP Fairbanks-Morse centrifugal pump. The water discharged from the plant flows into a 10-foot-deep, four-acre sludge pond from which a 2,500 gpm, 75 HP Fairbanks-Morse centrifugal pump re-circulates it again through the plant. Actually, the chief purpose of the 1,800 gpm pump down at the waterfront is to maintain an ample supply of wash water in the sludge pond, even though the water first passes through the plant on its way to the pond.

Washing and sizing operations are probably more clearly explained in the accompanying flow sheet than they could be in any number of words. Washing is thorough, but not difficult because of the inherent cleanliness of the material in the bank. The material grades well into sizes which enable the finished product to meet all specifications for various proportions of sand, grits and gravel.



The Finished Product

Of the 2,500 cubic yards production per day, about 70 per cent is sand to pass ⅛-inch slotted mesh; 10 per cent grits of two sizes (passing through ⅜-inch slotted mesh and retained on ¼-inch and passing through ¼-inch and retained on ⅛-inch); and 20 per cent gravel passing through 1¼-inch slotted mesh and retained on ⅜-inch.

After cleaning and sizing, the finished product is stored in four stock piles of different classes of material. Two radial Barber-Greene stackers handle fine grits and sand and two fixed Robbins stackers handle coarse grits and gravel, as shown in the flow sheet. Stock pile capacities are as follows: 35,000 yards of sand, 6,000 yards of which is free flowing; 60,000 yards of fine grits, 5,000 yards being free flowing; 3,000 yards of coarse grits, 1,800 yards free flowing; and 3,000 yards of gravel, 1,800 yards free flowing.

The "free flowing" refers, of course, to the ability of the materials in the stock piles to flow freely into the discharge hoppers beneath the piles and thence onto a reversible conveyor belt which operates in a tunnel under the piles. Thus 29,000 yards of sand, 55,000 yards of fine grits, 1,200 yards of coarse grits and 1,200 yards of gravel (if all the stock piles were full) would not flow freely into the discharge hoppers, but would have to be moved in some manner so they could be fed into the hoppers.

Here is where the two Bucyrus-Erie bulldozers on the Internation-

● **Top: Pushing a heaping load, this International TD-14 mounted Bucyrus-Erie 'dozer builds a temporary sand pit road. Bottom: General operations view showing early stage of the plant development.**

● Old concrete foundations of a former plant are utilized to support Jeffrey head and tail assemblies and idlers on the fixed feed conveyors.

al TD-40 tractors make themselves indispensable. They shove the sand, grit and gravel of the stock piles closer to the discharge hoppers so the material will flow down onto the reversible belt in the tunnel beneath. This reclaiming work with bulldozers and tractors is believed by company men to be far less expensive than the maintenance and amortization costs of such huge free flowing hoppers and additional conveyor systems as would otherwise be required.

Reclamation of stock pile material and removal of overburden are only two of the many jobs that keep the bulldozers and tractors busy all day long. Other work includes rough grading, cleaning up, drainage dike building, towing and an occasional bit of hoisting with a block and fall.

Material Loaded To Trucks and Scows

The map and flow sheet also show the way material is handled from the stock piles to the truck supply bins and scows, starting with a 250-foot reversible conveyor with a 30-inch belt in a 430-foot tunnel under the stock piles and traveling either 500 feet east to the truck bins by a 20-inch conveyor belt, or 1,750 feet west by a series of 30-inch conveyor belts to the bulkhead line at the waterfront.

Power for the various conveyors, as well as for the washing, sizing and pumping is all electric, 440 volt, 3 phase, 60 cycle, purchased from the local power company.

From three to four 650-yard scows are loaded per day, the average loading time per scow being a trifle more than two hours. The scows are warped along the bulkhead, under the discharge end of the Barber-Greene portable conveyor, by means of a Jeffrey electric winch, a small hopper feeding a swivel chute at the high end of the conveyor and providing effective distribution of the material across the scow decks.

The executive personnel of the Wm. P. McDonald Construction Company is as follows: Wm. P. McDonald, president; Thos. F. Spellane, treasurer; J. C. McDonald, secretary and general manager, Flushing; Wm. J. McLain, general manager, Port Jefferson. The main offices are located in Flushing, Long Island, a section of Greater New York near the New York World's Fair.

All roadway paving and maintenance at the New York World's Fair is one of the McDonald jobs, as well as many miles of city, county and state highway within a radius of 100 miles from Flushing. Wm. P. McDonald Construction Company, producing a goodly proportion of the higher grade sand available near New York City, supplies large amounts to other highway builders and users of sand, gravel and grits. In addition, Wm. P. McDonald operates the Macasphalt Corporation of America, patentors of a cold-laid bituminous highway material known as "Macasphalt." The McDonald organization was founded in 1911.

● Top: General cleaning up operations in the pit are handled by the Bucyrus-Erie 34-B. Bottom: Water for washing operations is provided by this sludge pond and 75 H.P. pump house at the left.

Milk Insurance

(Continued from page 579)

the machine cannot take it and can't make money for us—out she goes. We keep an accurate check on fuel and oil consumption and a record of output so that at all times we know exactly what the machine has done and for what cost." To prove his statements he produced a series of charts showing complete specifications of 288 machines owned and operated by the county. Careful records at headquarters reveal conditions and capacities of everything from waterpumps to snowplows. The commission is striving earnestly to put its operations on a plane equal or better to that of large private concerns and they claim that this system has put their road work on a paying basis. Commissioner Brayback constantly patrols all county jobs at various sections of the county and this former sheriff means business when he says, "When our equipment makes money, we can build roads at lower cost. And that after all is the only way to buy a road."

Orson Bean is foreman at the Howard Pit but, while things are humming smoothly, doesn't hesitate to ply the patrol or grease the crusher and every so often curse the rain water seeping into his haulage roads and threatening to mire the trucks as they roar on their way loaded with red gravel for the county's roads.

A section of the Leschen Laboratory where wire is being tested to determine its fitness. In this department are many other instruments, among which is an 800,000 pound capacity machine for determining the actual breaking strength of completed wire ropes.

"HERCULES" (Red-Strand) Wire Rope owes much of its outstanding performance record to the many rigid tests that must be undergone and survived, even before its actual manufacture begins.

In reality our entire plant is a proving ground from receiving door to shipping platform. Following the thorough testing of all materials, exacting inspections are made by experienced workmen during each step in the process of manufacture.

Your proving ground for wire rope is where you use it. Because of our accurate control of quality during manufacture, you can depend on "HERCULES" (Red-Strand) Wire Rope for maximum operating economy. And it is on the job . . . your proving ground . . . where "HERCULES" has won and where it continues to maintain its enviable reputation.

In order to be suitable for all purposes, "HERCULES" (Red-Strand) Wire Rope is made in a wide range of both Round Strand and Flattened Strand constructions—all of which are available in either the Standard or Preformed type.

MADE ONLY BY
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WIRE ROPE MAKERS — ESTABLISHED 1857
5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

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Yump Hansen Sells a Hole

By Stanley Donaldson

Several hundred years ago—that date is close enough,
For you can see the tooth marks yet, the digging was so tough—
Yump Hansen dug a hole as dark and deep as any well,
And on a board across the top he put the words FOR SELL.

"For sale, you mean," Yump's oiler said. Yump called him Moby Dick,
Since out of whales came oil in pails to grease the dipper stick.
(The staves from pails were in demand to line each brake and clutch,
So there was no objection when a man put on too much.)

Yump's shovel stood beside the hole, the dipper on the spoil,
And Yump stood at the runner's stand, his flat feet in the oil.
He tamped his chew of Jimson weed (tobacco weren't invented)
But since his lower lip stuck out, he really felt contented.

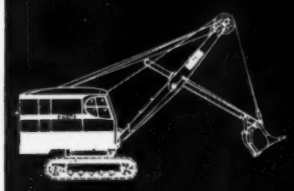
Said Moby Dick, "You sell this hole, I'll rustle you a buyer.
For ten per cent I'll rustle two and get the price up higher."
"You tink I get a buyer, huh?" Yump Hansen said. "That's swell,
For it's the toughest hole I dug; the bottom sure was Hell."

So Moby Dick set down the pail Yump bought for squeaks and gearing
And journeyed to a far-off town and got himself a hearing.
"We need a hole—" taxpayers wrote. Their major got the letter.
He read the first few words and said, "Let's vote the bonds and get 'er."

When Moby came to close the deal, his eloquence was ample;
He had the spiel, he knew his wares—he even had a sample.
The major made a speech. He said, "My friends, it might be worse:
We're bankrupt, but our city owns a Trylon in reverse."

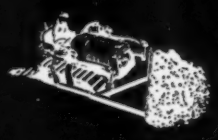
For your convenience in writing to A. Leschen & Sons Co., you will find a card bound in this issue.

Where to Buy BUCYRUS ERIE and BUCYRUS MONIGHAN Products



For Shovels, Draglines, Cranes, Clamshells, Skimmers, and Dragshovels 'Phone or Write the Nearest Dealer or Branch Office Listed Below.

For Large Shovels and Draglines, Walking Draglines, Bucyrus-Ruth Excavators, Blast-Hole, Prospecting, Oil Well, and Water Well Drills, 'Phone or Write the Nearest Bucyrus-Erie Branch Office Indicated Below with an °.



ALASKA: (See Washington, Seattle).
ARIZONA, PHOENIX: Crawford Tractor Co., 815 E. Jefferson St.
ARKANSAS, LITTLE ROCK: Lyons Machinery Company.
CALIFORNIA, LOS ANGELES: Crook Company, 2900 Santa Fe Avenue, Phone Kimball 5137.
°SAN FRANCISCO: Bucyrus-Erie Company, 390 Bayshore Blvd. Phone Atwater 2341.
OAKLAND: Industrial Equipment Co., Outer Harbor.
COLORADO, DENVER: Ray Corson Machinery Co., 1646 Wazee Street.
CONNECTICUT, NEW HAVEN: The W. I. Clark Co., 1811 Dixwell Ave.
FLORIDA, JACKSONVILLE: Quinn B. Barton, Inc., 1305 W. Forsyth St.
°GEORGIA, ATLANTA: Bucyrus-Erie Co., 1508 William-Oliver Bldg. Phone Jackson 1545.
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°MASSACHUSETTS, BOSTON: Bucyrus-Erie Company, 240 N. Beacon St. Phone Stadium 3152.
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MINNEAPOLIS: Wm. H. Ziegler Co., Inc., 2331 University Ave., S. E. Phone Gladstone 7971.
MISSISSIPPI, JACKSON: Mississippi Road Supply Co., Telephones: Long Distance 9906. Local 3676.
°MISSOURI, KANSAS CITY: Bucyrus-Erie Company, 1007 Fairfax Bldg. Phone Harrison 4811.
°ST. LOUIS: Bucyrus-Erie Company, 818 Olive St.—Suite 906. Telephone Chestnut 1354.
MONTANA, MISSOULA: Westmont Tractor & Equip. Co.
NEBRASKA, OMAHA: Cardinal Supply & Mfg. Co., Sunderland Bldg.
OMAHA: Fuchs Mchy. & Supply Co., 1102 Farnam Street.
°NEW JERSEY, ENGLEWOOD: Bucyrus-Erie Company, 214-216 South Dean Street. Phone 3-6727.
NEW MEXICO, ALBUQUERQUE: R. L. Harrison Co., Inc., 209 N. 4th Street.
°NEW YORK, NEW YORK: Bucyrus-Erie Company, 30 Rockefeller Plaza, Suite 5050. Phone Columbus 5-4395.
ALBANY: Contractors Sales Co., Inc., P. O. Box 949.
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°SYRACUSE: Bucyrus-Erie Company, 303 Draper Ave. Phone 6-1078.
NORTH CAROLINA, GREENSBORO: E. F. Craven Company.
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COLUMBUS: H. S. Robertson, Walhalla Rd. Phone Jefferson 3242.
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OKLAHOMA, GUTHRIE: Clarence L. Boyd Co., Inc., 501 West Oklahoma.
OKLAHOMA CITY: Clarence L. Boyd Co., Inc., 17 S.W. Pottawatomie St.
OREGON, PORTLAND: Clyde Equipment Co., 17th & Thurman Streets. Phone Broadway 5561.
°PENNSYLVANIA, PHILADELPHIA: Bucyrus-Erie Company, 821 Commercial Trust Bldg. Phone Rittenhouse 4281.
PHILADELPHIA: Furnival-Rimmer Co., Lancaster Ave. at 54th St. Phones: Trinity 5200 and West 1617.
BRADFORD: Beckwith Mchy. Co., 361 Congress St.
HARRISBURG: Beckwith Machinery Co., 635 N. Cameron St. Phone 4-4064.
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BRITISH COLUMBIA, VANCOUVER: Finning Tractor and Equip. Co.
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ONTARIO, TORONTO: F. H. Hopkins & Co., Ltd., Commerce & Transportation Building.
QUEBEC, MONTREAL: F. H. Hopkins & Co., Ltd., 340 Canada Cement Bldg., Phillips Square. Phone Plateau 1136.

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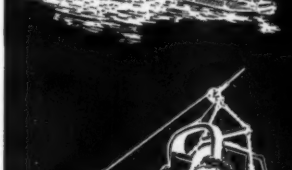
You can choose a modern Bucyrus-Erie and be sure of getting performance exactly suited to your needs. In 60 years Bucyrus-Erie has built over 28,000 machines for the excavating, drilling and material-handling field. With sales and service representation in all principal countries of the world, Bucyrus-Erie has a breadth of experience that is added assurance of the performance you want.



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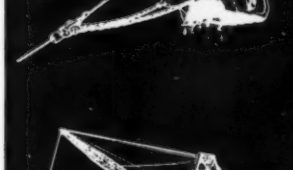

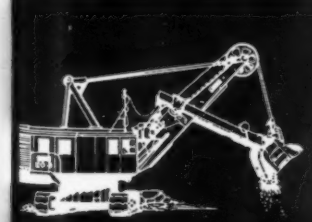

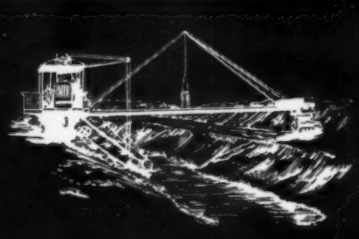

Notes from the manufacturers

Charles Coursey Pittman, member of the Caterpillar Tractor Company's sales development division, and editor of the sales magazine, "Caterpillar" News, died suddenly, on August 16, at the age of 30, of a heart attack. Mr. Pittman was born in Rushville, Illinois, and was correspondent for a Peoria newspaper before going to Caterpillar. During his six year stay there he initiated and developed "Caterpillar" news. His death came as a shock to his many friends.

The John A. Roebling's Sons Company of Trenton, New Jersey, announce the creation of a new export division to be located at 19 Rector Street, New York City. W. P. Laseter, who comes to Roebling from the Oil Well Supply Company where he served as assistant manager of the export department, has been appointed manager of this new division.

Gar Wood Industries, Inc., Detroit, Michigan, according to a recent announcement made by W. H. Hammond, sales manager of the hoist and body division, has appointed H. A. Myers assistant branch manager of their factory branch at Long Island City, New York.

The Asphalt Institute, J. E. Pennybacker, managing director, has announced the appointment of Allan W. Dow as consulting technologist for the institute. Mr. Dow is a pioneer and leading authority in the field of asphalt paving and served for twelve years as chemist for the District of Columbia engineering department.

Chain Belt Company, Milwaukee, Wisconsin, announces the removal of its Minneapolis office from 808 LaSalle Avenue to 1645 Hennepin Avenue. R. X. Raymond, who has been associated with the Chain Belt Company for over twenty years, is Minneapolis district manager.

The Wellman Engineering Company, Cleveland, Ohio, recently elected J. C. Hodge as vice-president and director of their firm. Dr. Hodge's training and experience are well suited for the problems of metallurgy in welding and the selection of special steels for specific uses entering into Wellman engineered equipment.

The Harnischfeger Corporation, Milwaukee, Wisconsin, has rearranged the supervision of its Canadian business. Henceforth, all matters pertaining to Canada will be under the supervision of Deane S. Holt of the company's export division. This change applies to the whole of Canada except the provinces of British Columbia and Alberta, which will remain under the jurisdiction of the Harnischfeger Seattle office.

Chicago Pneumatic Tool Company, 6 East 44th St., New York City, announces the appointment of P. J. Christy as manager of their Philadelphia office, effective August 1, 1940. He succeeds A. M. Brown who has been transferred to Washington, D. C. as manager of the new branch recently opened there.

The American Blower Corporation's Hydraulic Coupling Division, 6000 Russell Street, Detroit, Michigan, announces that machines in fields other than the automotive industry are making greater headway with the use of Fluid Drive. According to C. T. Morse, president of the American Blower Corporation, a Euclid truck and a Harnischfeger 2½-yard shovel operating on the Minnesota iron range, a big dredge working in the Tennessee river and a strip conveyor in a Cleveland steel mill are a few installations equipped with this Fluid Drive system.

The Marmon-Herrington Company, Indianapolis, Indiana, announces the completion of its recent building program. The company's plant site now comprises 16 acres of ground.

New trade literature

Title: **Lessons in Arc Welding**

Subject: A new book which will be found helpful not only by beginners learning to arc weld but also by welding officials such as supervisors, foremen, instructors and others seeking a ready reference to fundamental information on arc welding and a guide to its proper application. The publication contains 144 pages and over 100 illustrations.

Where to Get: The Lincoln Electric Company, 12818 Coit Road, Cleveland, Ohio, or any of their dealers or representatives. Price, fifty cents per copy, postage prepaid anywhere in the U. S. Elsewhere seventy-five cents.

Title: **Winter Roads & Streets**

Subject: Condensed information on the maintenance of roads and streets in winter time.

Where to Get: Caterpillar Tractor Company, Peoria, Illinois. Free upon request, ask for Form 6197.

Title: **Types of Hose**

Subject: A descriptive and illustrative bulletin about hose for use with air tools used in construction, mining and petroleum industries; tough hose for heavy construction, flexible hose for easy handling, combination air and water hose, suction hose, etc.

Where to Get: Sullivan Machinery Company, Michigan City, Indiana. Free upon request, ask for bulletin 87-Z.

Title: **LeTourneau Scraper Booklet**

Subject: An 8-page review in an interesting, pictorial form presenting the LeTourneau Carryall scraper, from 15 to 33 yard capacities, on various large scale construction jobs including the Pennsylvania Turnpike.

Where to Get: R. G. LeTourneau, Inc., Peoria, Illinois, or any LeTourneau "Caterpillar" dealer. Free upon request, ask for bulletin A-014.

The OWEN BUCKET Co. 6095 BREAKWATER AVE., CLEVELAND, OHIO
BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIF.

For your convenience in writing to Owen Bucket Co., you will find a card bound in this issue.

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o EXCAVATING ENGINEER . . . . . at South Milwaukee, Wisconsin

BLAST HOLE DRILL OPERATOR

Blast hole drill operator, 10 years' experience on gas, diesel and electric, large and small machines. Can do own repair work. Middle age, single and willing to go anywhere in U.S.A. Excellent references. Box 9160

EXPERIENCED OPERATOR

Operator with fifteen years' experience on gasoline and diesel powered shovels, draglines, and crane-clamshell machines on highway and sewer construction jobs desires steady work anywhere. Preference: Northwest shovel or dragline about 2 yard capacity. Can do own repair work. References furnished. Age 32. Married. Now located in Missouri. Box 9159

CREDIT—COLLECTION

University education. Experienced with major road making and excavating machinery manufacturers in office and field work. Proven record. Box 9162

BLAST HOLE DRILL OPERATOR

Three years' steady employment on Loomis Clipper "44", Cyclone piston type 1200-G and Bucyrus-Armstrong 27-T and 42-T, gas and electric blast hole drills on Penna. anthracite coal field. Able to make repairs. Unmarried. Age 39. Now located in Pennsylvania; willing to go anywhere. Can furnish best of references. Wants steady job on any blast hole drill; preference Armstrong. Box 9161

ALL-AROUND OPERATOR

Can operate any kind of machine, large or small. Can do own repair work. Have had experience in quarry, ore and coal stripping; familiar with grading work. Can operate steam, diesel, gas or electric. Would like steady employment on large-scale operation. Will furnish references. Box 9164

CABLEWAY OPERATOR

Experienced slackline cableway operator wants work operating slackline or dragline. References.

Tom N. Hudson
Route 4, Boone, Iowa

Title: **Eye & Face Protection**

Subject: A new 72 page catalog, filled with many ideas regarding the protection of eyes and face.

Where to Get: Sellstrom Manufacturing Company, 615-649 North Aberdeen Street, Chicago, Illinois. Free upon request, ask for catalog No. 18.

Title: **Buckeye Trencher in Operation**

Subject: The first of the new Buckeye 410 boom type trenchers to be sold was followed up with a camera. The results and check sheets are shown in this new bulletin.

Where to Get: Buckeye Ditcher Company, Findlay, Ohio. Free upon request, ask for bulletin 45.

Title: **Folder on Elastic Stop Nuts**

Subject: A concise explanation of the construction and self-locking action of Elastic stop nuts.

Where to Get: Elastic Stop Nut Corporation, 2332 Vuaxhall Road, Union, New Jersey. Free upon request.

Title: **The Painting of Creosoted Wood**

Subject: A new leaflet describing seasoning after treatment and gives directions for painting creosoted poles and posts with aluminum paint.

Where to Get: Wood Preserving Corporation, Pittsburgh, Pennsylvania. Free upon request.

Title: **Goodall Rubber Goods Catalogue**

Subject: Designed to be of particular value to construction, petroleum, chemical industries, mines and quarries, utilities and municipalities, this 68 page book deals with the manufacturers general line of mechanical rubber goods.

Where to Get: Goodall Rubber Company, Inc., 5 South 36th Street, Philadelphia, Pennsylvania. Free upon request. Ask for catalogue No. 207.

Title: **Roads and Streets Construction Methods and Costs**

Subject: Assembled data on a wide variety of road and street problems in the most readily usable form. Designed for use by contractors, engineers, and those highway officials who are concerned with bids, costs and estimates.

Where to Get: Roads and Streets Publishing Company, 330 South Wells Street, Chicago, Ill. Price, $6.00 prepaid.

Title: **Type N Torch Catalogue**

Subject: A general description of the improvements and other facts about Type N Torch are outlined.

Where to Get: The Alexander Milburn Company, 1416-1428 W. Baltimore Street, Baltimore, Maryland. Free upon request.

Title: **Concrete Mixing, Paving and Handling Bulletin**

Subject: A birdseye review of the manufacturers entire line of mixers, pneumatic placers, buckets, carts, bins, towers, mast plants, etc.

Where to Get: Ransome Concrete Machinery Co., Dunellen, New Jersey. Free upon request. Ask for bulletin No. 167.

Title: **"Compo" Bearings Stock List No. 1**

Subject: A booklet in which many sizes of bearings are tabulated, supplemented by valuable information to designing engineers with regard to permissable loads, shaft clearances and installations.

Where to Get: Bound Brook Oil-Less Bearing Company, Bound Brook, New Jersey. Free upon request.

Title: **Bucket Catalog**

Subject: A 40 page review, illustrating and describing buckets for single drum hoists. The catalog is also replete with service lists and application data.

Where to Get: Blaw-Knox Company, Pittsburgh, Pennsylvania. Free upon request. Ask for bulletin No. 1696.

Title: **Simple Blue Print Reading with Special Reference to Welding**

Subject: This 138 page book affords a basis for study of blue print reading together with practice in the actual reading of drawings. While this book has been compiled and published primarily for welders, it contains information of value for anyone concerned with mechanical construction.

Where to Get: The Lincoln Electric Company, 12818 Coit Road, Cleveland, Ohio, or any of their dealers or representatives. Price, fifty cents per copy, postage prepaid anywhere in the U. S. Elsewhere, seventy-five cents.

Title: **Diesel Engine Catalogue**

Subject: Volume five of the Diesel Engine catalogue contains a detailed description of one hundred and twenty-four different and distinct diesel engines. This 312 page book, of technical data on all available diesel engines, is written by Rex W. Wadman.

Where to Get: Diesel Engines, Inc., Two West Forty-Fifth Street, New York City, New York. Price, $3.00 prepaid.

Title: **Kennametal Price Schedule**

Subject: Announcement of new low prices on standard Kennametal steel-cutting tools featured by prevailing low prices for the general small user.

Where to Get: McKenna Metals Co., Latrobe, Pa. Free upon request.

Title: **Mechanical Goods Catalog**

Subject: Contains a vast amount of information on Goodrich rubber products and serves a threefold purpose in that the volume consists of a condensed catalog, engineering data and guide to selection of various products.

Where to Get: B. F. Goodrich Company, Akron, Ohio. Free upon request.

FOR SALE

RATES: 60c per line—minimum charge $2.40. Repeat insertions with no change in copy—three insertions for the price of two. ¶ Display advertising in this section at published display advertising rates. ¶ Estimate 41 characters per line, counting all spaces and punctuation as one character each. Allow ten characters for box number for blind advertisements. If address given, counts same as advertising copy. ¶ Rates are net (no commission, no discount) and payable in advance of publication. Send your remittance with insertion order and copy. ¶ Closing date—15th of preceding month. Example—January issue closes December 15.

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TRUCK CRANES and SHOVELS

QUICKWAY Gas Truck Shovel and Crane. ½ yard shovel equipment including 1¼ yd. Snow dipper. 25' plus 10' insert crane boom. Mack Bulldog truck. Used very little. Excellent condition. Less than two years old. Located Boston. Box 2568

SMALL SHOVELS, CRANES AND DRAGLINES
Up to 2½ Cubic Yards

BUCYRUS-ERIE 43-B—2 cu. yd. Diesel Shovel. Electric lights. Buda engine. Electric starter. Long and wide cats. 33" treads. Extensively field reconditioned. Located Western Pennsylvania. Box 2484

BUCYRUS-ERIE 10-B Gas Dragline. First class condition. Located California. Box 2599

TWO BUCYRUS-ERIE ELECTRIC TUNNEL SHOVELS. Model 33-B—17' Booms—14' 1½" Dipper Handles—1½ cu. yd. cast Rock Dippers. 60 H.P., 2 phase, 60 cycle, 440 volt motors. Only used one short job. Located Western Pennsylvania. Box 2608

LINK-BELT MODEL K-44. 60' boom Clamshell and Dragline. Gas power. Located Missouri. Box 2616

BUCYRUS-ERIE GA-2 High Lift 1 yd. Shovel and 45' Boom Crane. Waukesha WS engine. Single Shaft Cats. Operating condition. Located eastern Pennsylvania. Box 2566

BUCYRUS-ERIE 37-B Gas Dragline. 2-cu. yd. bucket. Kohler 1½ KW Light Plant. 2 flood lights. 40' boom. Long and wide cats. Wisconsin 6 cylinder engine. Good operating condition. Located Mississippi. Box 2601

LINK-BELT MODEL K-48 Gas Shovel. 1¾-yd. Esco dipper. Good operating condition. Located Montana. Box 2618

BUCYRUS-ERIE GA-2 Gas-Air high lift shovel. 24' boom. 18'4" dipper handle. 1¼ yd. dipper. Waukesha 6¼"x8" 4-cylinder engine. Electric starter. Quantity spare parts included. Excellent condition. Located Eastern Pennsylvania. Box 2559

KOEHRING MODEL 1-A. Combination 40' boom crane and dragline. Gasoline. Wisconsin engine. Operating condition. Located near St. Louis. Box 2402

NORTHWEST MODEL 6 50' boom Gas Crane. Long cats. 4-cylinder Twin City engine. Excellent condition. Located New York City. Box 2615

KEYSTONE MODEL 4 — Gasoline dragshovel. Operating condition. Located western Pennsylvania. Box 2526

NORTHWEST 6—1½ yd. Shovel. Twin City Oil Engine. Operating condition. Located California. Box 2482

LORAIN MODEL 55, 1-yd. Diesel Shovel. Caterpillar D-8800 4 cylinder engine. Excellent condition. Located Virginia. Box 2597

BUCYRUS-ERIE 50-B Steam Coal Loader. 2-yd. dipper with sides built up to 2¼-yd. Turbine Light Plant. A-1 condition. Quantity spares included. Ready to operate. Located Indiana. Box 2620

BUCYRUS-ERIE Model E-2 diesel crane and dragline, shop No. 10984, equipped with 50 ft. boom, Kohler Light Plant and Atlas diesel engine. Located Eastern Oklahoma. Bargain. Box 2611

BUCYRUS-ERIE GA-3 Gas-Air 1¼-yd. shovel Waukesha 4-cylinder 6¾"x8" engine. Good operating condition. Now operating Arizona. Box 2578

BYERS MODEL 128 ⅜-yard Gas Shovel. 35' Clamshell Boom and ½-yard Erie Clamshell Bucket and Back Hoe. Hercules Engine. Good operating condition. Reasonably priced. Located near Pittsburgh, Pa. Box 2495

LORAIN MODEL 60, 1-yd. Gas Shovel. Electric Starter. Waukesha Engine. Good operating condition. Located Minnesota. Box 2594

BUCYRUS-ERIE Type B High Lift ¾-yard steam shovel. Operating condition. Located vicinity Boston. Box 2401

NORTHWEST MODEL 6 Dragline, 60' Boom. 1½-yd. Page Drag Bucket. 1500W Kohler Light Plant, Wisconsin—D-S-4—6 cylinder 5¾"x6" engine. Good operating condition. Located Indiana. Box 2596

BUCYRUS-ERIE 43-B Diesel 1¾-yd. Shovel and 50' boom Dragline. Buda 6 cylinder 6½"x8¾" engine. 33" cat treads. 1½ KW Kohler light plant. Said to be in excellent condition throughout. Located Texas. Box 2577

NORTHWEST MODEL 8, 60' boom Dragline. 1½-yd. Page bucket. Kohler light plant. 33" cat treads. Twin City gas engine. Reconditioned in summer 1939, used only five or six months since. Located Illinois. Box 2617

FOR SALE - $7500.00

Marion Dragline Model 221

90' Steel Boom — 2 yard Class C Page Bucket—self propelling on wide gauge track — also shovel equipment same unit good mechanical condition.

H. D. Conkey & Company
Mendota, Illinois

BUCYRUS-ERIE 30-B Diesel 50' boom Dragline. 1¼ yd. Page drag bucket. Good operating condition. Located Illinois. Box 2540

BUCYRUS-ERIE 43-B Gas Shovel. 23' boom, 17' dipper handle, 1½-yd. dipper. Chain crowd. Electric starter. Wisconsin 6-cylinder 6"x7" Model E engine. Extensively repaired. Excellent shape. Located vicinity Boston. Box 2556

BUCYRUS-ERIE 50-B Diesel Dragline Kohler Light Plant. Worked less than half the time since sold new. Good condition. Located Illinois. Box 2580

MARION MODEL 40-A Electric Dragline. 60' boom. Powered by 150 HP electric motor 3-phase 60 cycle 2300 volt. Excellent condition. Ready to go to work. Actually operated only 1200 hours. Located Utah. Box 2621

AUSTIN MODEL "MA" Gasoline Dragline—37' Boom—¾ yd. Page "M" drag bucket. Good operating condition. Located western Nebraska. Box 2579

BUCYRUS-ERIE GA-2 Gas-Air 1¼ yd. extra high lift shovel. Waukesha engine. Excellent condition. Located northwestern Pennsylvania. Box 2576

BUCYRUS-ERIE 41-B 1¼-yd. Steam Shovel. Cat mounted. Reasonably priced. Located Vermont. Box 2614

BUCYRUS-ERIE 45-B Diesel Dragline. 70' boom. Bargain price. Located Florida. Box 2619

MARION MODEL 381 2-yd. shovel powered by Hesselman engine. Extensively repaired. Excellent condition. Available for demonstration. Located northwestern Pennsylvania. Box 2560

BUCYRUS-ERIE HIGH LIFT 55-B Diesel Shovel. 35' boom. 22' dipper handle. 2-yd. dipper. Kohler light plant. Atlas 6-cylinder 6½" x 8½" engine. Good operating condition. Located Central New York state. Box 2627

2—MARION MODEL 331 ELECTRIC TUNNEL SHOVELS. 16' booms—12'11" dipper handles—¾ yd. dippers. Suitable for operation on 3 phase 60 cycle 440 volt power supply. Included also 110'—3 conductor No. 2—W-600V Portable cable with Miller plug on one end. Also 1000' additional 3 conductor No. 2 cable. Located Seattle, Washington. Box 2565

NORTHWEST MODEL 85 Dragline. 80' Boom. 2-yd. Basket Type Drag Bucket. Light Plant. Twin City Oil Engine, 4 cylinder 8"x9". Only used 21 months. Located Louisiana. Box 2593

BUCYRUS-ERIE 32-B Gas Dragline. 45' boom. 26" cat treads. 1¼-yd. Page drag bucket. Wisconsin 6-cylinder 5" x 6" engine. Located Nebraska. Box 2626

LARGE SHOVELS, CRANES AND DRAGLINES
2½ Cubic Yards and Over

BUCYRUS-MONIGHAN Model 3½-T—70' boom dragline. 2½-yard dragbucket. Fairbanks Morse Diesel engine. Located North Dakota. Box 2582

CLASS 230 Bucyrus-Erie Steam Dragline with 175' Aluminum Alloy Boom, 8-Cu. Yd. Bucket. Burns coal or oil. Excellent condition. Ready to work. Box 2561

Marion Model 70 Steam Shovel
Marion Model 91 Steam Shovel
Marion Model 76 Steam Shovel
All the above in operating condition and located in Pennsylvania. Box 2598

BUCYRUS-MONIGHAN 4-W Diesel Dragline. 110' Boom. 4½-yd. Bucket. Reported good working condition. Some extra parts included. Located Georgia. Box 2581

MARION No. 125 Steam Shovel. 2¾-yard, 55 ft. boom, 36 ft. sticks. On cats. Light plant. Now working Central Missouri. Good condition. Priced to sell. Box 2586

ANY FAIR OFFER ACCEPTED

BUCYRUS-ERIE—Class 24 steam dragline. 100 foot boom, 5 cubic yard bucket. Skid and roller mounted. Rebuilt 1927 at a cost of $15,000. New locomotive boiler installed 1928. Will accept any fair offer. Located near Fort Worth, Texas. Box 2609

BUCYRUS-ERIE CLASS 230 Diesel Electric Dragline. 150' boom. 6-cu. yd. bucket. Light weight cats. Powered by two units each consisting of Atlas Diesel 6-cylinder 9"x10½" engine and 120 KW 250 volt direct current generator. Hoist motor 250 HP. Swing motor 75 HP. Can be bought at bargain. Located Florida. Box 2622